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HARVARD

GARDEN OF CHAMP DE MARS.

REPORTS

OF THE

UNITED STATES COMMISSIONERS

TO THE

UNIVERSAL EXPOSITION OF 1889

AT PARIS.

PUBLISHED UNDER DIRECTION OF THE SECRETARY OF STATE
BY AUTHORITY OF CONGRESS.

VOLUME I.

REPORT OF THE COMMISSIONER-GENERAL, WITH ACCOMPANYING DOCUMENTS INCLUDING REPORTS OF OFFICERS OF THE COMMISSION, OFFICIAL REGULATIONS, CLASSIFICATION, LISTS OF EXHIBITORS, AWARDS, ETC.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1890.

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For Ludwig Katz

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INTRODUCTION.

INTRODUCTORY LETTER FROM THE SECRETARY OF STATE.

To the Senate and House of Representatives:

By a note of April 6, 1887, the Republic of France, through its minister plenipotentiary at this capital, invited the Government of the United States to take part in an exposition of works of art and the products of manufactures and agriculture of all nations, to be held at Paris, commencing May 5, and closing October 31, 1889.

Congress, by joint resolution approved May 10, 1888, authorized the acceptance by this Government of the invitation so courteously extended. It also appropriated the sum of $250,000 to defray the necessary expenses of the participation of this Government in the exposition, including the proper installation of the exhibition, and the expenditures of the Commissioner-General, made under the direction of the Secretary of State. Section 2 of the joint resolution provided for the appointment by the President, by and with the advice and consent of the Senate, of a Commissioner-General and subordinate officers to represent the United States in the proposed exposition, and fixed the allowance accorded to each.

Section 4 made it the duty of the Secretary of State to transmit to Congress a detailed statement of the expenditures which may have been incurred under the provisions of this resolution, together with all reports called for under section 2 of the same, which reports shall be prepared and arranged with a view to concise statement and convenient reference.

I now transmit a copy of a letter from the Commissioner-General, dated Hartford, Conn., the 2d instant, forwarding his official report and the data to complete Volume I. General Franklin also incloses a memorandum showing the contents of four other volumes which will soon be ready for transmission to Congress. The detailed statement of expenditures, called for by Section 4, will be transmitted to Congress at the earliest practicable date.

Respectfully submitted.

JAMES G. BLAINE.

DEPARTMENT OF STATE,
Washington, June 9, 1890.

JOINT RESOLUTION OF CONGRESS.

[PUBLIC RESOLUTION—No. 11.]

JOINT RESOLUTION accepting the invitation of the French Republic to take part in an International Exposition to be held in Paris in eighteen hundred and eighty-nine.

Whereas, the United States have been invited by the Republic of France to take part in an exposition of works of art and the products of manufactures and agriculture of all nations, to be held in Paris, commencing the fifth day of May and closing the thirty-first day of October, eighteen hundred and eighty-nine: Therefore,

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That said invitation is accepted, and that the governors of the several States and Territories be and are hereby requested to invite the people of their respective States and Territories to assist in the proper representation of the productions of our industry and of the natural resources of the country, and to take such further measures as may be necessary in order to secure to their respective States and Territories the advantages to be derived from this beneficent undertaking.

SEC. 2. That the President, by and with the advice and consent of the Senate, shall appoint a Commissioner-General to represent the United States in the proposed Exposition, and under the general direction of the Secretary of State, to make all needful rules and regulations in reference to the contributions from this country, and to control the expenditures incident to the proper installation and exhibit thereof; the pay of jurors, and the preparation of the reports on the Exposition and the general results thereof; and an Assistant Commissioner-General to act under the direction of the Commissioner-General, who shall perform the duties of Commissioner-General, in case of his death or disability; and that the President may also appoint as assistants to the Commissioner-General nine scientific experts, corresponding to and specifically assigned to the nine groups into which the Exposition will, under the official regulations, be divided; that the allowance to said Commissioner-General for salary and personal expenses shall not exceed ten thousand dollars for his whole term of office; that the allowance of said Assistant Commissioner-General for salary and personal expenses shall not exceed five thousand dollars for his term of office; and the allowance of the nine scientific experts for salary and personal expenses shall not exceed fifteen hundred dollars each, not including such clerical service as may be allowed by the Commissioner-General, which shall not exceed fifteen thousand dollars.

SEC. 3. That in order to defray the necessary expenses above authorized, and for the proper installation of the Exhibition, and the expenditures of the Commissioner-General made under the direction of the Secretary of State, and with his approval, and not otherwise, there be and hereby is appropriated, out of any money in the Treasury of the United States not otherwise appropriated, the sum of two hundred and fifty thousand dollars, or so much thereof as may be necessary for the purposes herein specified, which sum shall be expended under the direction of the Secretary of State. The Commissioner of Agriculture is hereby authorized to collect and pre-

pare suitable specimens of the agricultural productions of the several States and Territories of the Union for exhibition at the Paris Exposition, and to accompany the same with a report respecting such productions, to be printed in the English, French, and German languages, the expense of the same to be paid out of said appropriation.

SEC. 4. That it shall be the duty of the Secretary of State to transmit to Congress a detailed statement of the expenditures which may have been incurred under the provisions of this resolution, together with all reports called for under section of this resolution, which reports shall be prepared and arranged with a view to concise statement and conveinent reference.

Approved May 10, 1888.

OFFICIAL INSTRUCTIONS OF THE SECRETARY OF STATE TO THE COMMISSIONER-GENERAL.

DEPARTMENT OF STATE,
Washington, July 6, 1888.

SIR: By a joint resolution of Congress, approved May 10, 1888, the United States accepted the invitation of the Republic of France to take part in an exposition of works of art and the products of manufactures and agriculture of all nations, to be held in Paris, commencing the 5th day of May and closing the 31st day of October, 1889.

The resolution further provided that the President, by and with the advice and consent of the Senate, should appoint a Commissioner-General to represent the United States at the proposed Exposition; and, under the general direction of the Secretary of State, to make all needful rules and regulations in reference to the contributions from this country, and to control the expenditures incident to the proper installation and exhibit thereof, the pay of jurors, and the preparation of the reports on the Exposition and the general results thereof.

Under the authority thus conferred, the President, by and with the advice and consent of the Senate, has now appointed you Commissioner-General. Your commission as such, bearing date June 21, 1888, has already been delivered to you.

The resolution further provides that the allowance to the Commissioner-General for salary and personal expenses "shall not exceed $10,000 for his whole term of office."

In view of the fact that your duties will commence forthwith, and will continue until at least October 31, 1889, and for some time after that, you will receive the sum of $600 in each month, and at the close of your service and settlement of your accounts any balance remaining of the $10,000 so appropriated may be allowed you.

The joint resolution further provides for the appointment of an Assistant Commissioner-General, whose duty it will be to act under your direction and to perform your duties in case of death or disability. The President, by and with the advice and consent of the Senate, has appointed Mr. Somerville Pinkney Tuck to this office; and his commission, bearing the same date as your own, has been per-

sonally delivered to him. For the reasons already set forth in reference to the allowance to be made to you, I have decided to allow Mr. Tuck the sum of $300 a month, and at the close of his service he may be paid any balance remaining of the $5,000 appropriated.

With regard to the term "personal expenses," as used in this resolution, I am of opinion that it is intended to cover the ordinary expense of a residence abroad during such period as may be necessary in the discharge of your duties, and also the expense of journey from the United States to Paris and back again. It may be, however, in the discharge of your duties, that either you or the Assistant Commissioner-General will find it necessary to make a special visit to Paris in order to prepare for the exhibition, or to receive information to enable you to make such preparation. The expense of such a journey, in my opinion, would not be regarded as a "personal expense" of your own, or of the Assistant Commissioner-General, and might properly be charged among the other incidental expenses of your service.

The joint resolution further provides that "the President may also appoint as assistants to the Commissioner-General nine scientific experts, corresponding to and specifically assigned to the nine groups into which the Exposition will, under the official regulations, be divided; * * * and the allowance of the nine scientific experts for salary and personal expenses shall not exceed $1,500 each."

The duties of the scientific experts here referred to will not probably begin actually until at or near the time of the opening of the Exposition, so that the questions whether the President should appoint such experts, and if so, who may wisely be appointed to these positions, may, for the present at least, be deferred. It will be well

The appropriation for the representation of the United States at the Paris Exposition is $250,000. Out of this amount there is provision made in the joint resolution for certain specific expenses not to exceed the following sums, viz:

Commissioner-General	$10,000
Assistant Commissioner-General	5,000
Nine scientific experts at $1,500	13,500
Clerical service	15,000
	43,500
Leaving	$206,500

In addition to these items for which definite appropriation was made in the resolution, the Commissioner of Agriculture is authorized "to collect and prepare suitable specimens of the agricultural productions of the several States and Territories of the Union for exhibition at the Paris Exposition and to accompany the same with a report respecting such productions * * * the expense of the same to be paid out of said appropriation."

The Department interprets this clause as meaning that the expense of the collection and preparation of such an exhibit as the Commissioner of Agriculture may see fit to prepare, together with the expense of making and printing a report in regard thereto, is to be paid out of the general appropriation of $250,000; and it is further understood that inasmuch as the expenditure of the money is to be under the direction of the Secretary of State and made "with his approval and not otherwise," the expenditures so to be made by the Commissioner of Agriculture shall be under my direction and subject to my approval. It will therefore be proper to determine in advance what amount should be allotted to this purpose, with due regard to the interests of other exhibitors, and you will at an early day consider and report the proper amount for this purpose, and any other suggestions which you may think proper to submit, touching the agricultural exhibit.

It will be well to specify distinctly what class of expenses should be borne out of the sum to be so set apart for the collection and preparation of the exhibit in question and whether such sum should include the cost of freight and installation in the Exposition, care and supervision while there, and the like.

The main object of the joint resolution was to authorize the participation by citizens of the United States as exhibitors and competitors for the prizes and the ulterior advantages of an extended market, as well as to obtain trustworthy information of the progress of the industrial arts as shown by the exhibits, and especially an intelligent survey of the present commercial needs of European countries and the direction in which the industrial productions of the United States may obtain access thereto.

It will therefore be your duty, as soon as possible, to take steps for making known the details and plans of the Exposition and for instructing intending exhibitors with regard to the opportunities for forwarding their goods.

It will also be your duty to receive and place the exhibits at Paris and to supervise the compilation of the catalogues wherein the character and merits of the exhibits should be properly set forth, to secure to the exhibitors a fair opportunity for competition for the prizes which it is understood will be awarded; and to enforce su rules, with the consent of the local authorities and general commiss of the Exposition, as will insure good order in the American dep ment. When the Exposition is ended, your assistance shoul rendered to the American exhibitors for the removal and the delivery to them of their several exhibits.

You will also, under the terms of the resolution, prepare a rep·rt upon the Exposition and the general results thereof; and this should be accompanied by special reports of each of the scientific experts on the matters coming specially within their observation, as well as by such other papers as you may be able to secure relating to all matters of interest; of new inventions, of valuable productions, and the means whereby commercial exchanges between the United States and France or neighboring European countries may be extended. All such reports by competent persons will be proper for submission.

The joint resolution provides that all reports submitted by you "shall be prepared and arranged with a view to concise statement and convenient reference."

The incidental expenses of your service may properly include freight upon exhibits from the United States to Paris and back at

it, a reasonable sum will be placed subject to your control for the purposes and objects indicated; and upon your leaving the country to proceed to Paris, a letter of credit on a banking-house in London will also be handed to you.

In order, however, to comply with the requirements of law, and secure the Government against loss, it will be necessary, in case you desire an advance of money, that you, or one of your assistants or subordinates, should be designated to act as a disbursing officer of the United States, in whose hands funds may be placed, and who will be required to give bond to the United States in double the amount advanced.

In disbursing these amounts, and such other sums within the appropriation made as may be authorized by this Department, an itemized statement will be duly prepared under your direction, and submitted to this Department for its approval and for allowance. It must carefully be borne in mind by all persons connected with the representation of the United States in the Paris Exposition, that in no event must the expenses of the United States in this connection exceed the sum appropriated by Congress. You are especially notified that no obligations are authorized which shall involve other or greater liabilities than those within the intent and meaning of your instructions; and all proper expenses should be met by cash payments.

This Department will address to the governor of each State and Territory an official notification in the language of the resolution of Congress; and the heads of the several Departments will be consulted as to the possibility of official co-operation.

All replies received to these communications will be transmitted to you.

You will make monthly reports to the Department of your expenses, and from time to time you will report any official acts in connection with the Exposition which will serve to keep the Department advised of your operations.

Your communications should be numbered consecutively for convenience of reference and for the files.

In conclusion I have pleasure in expressing my confidence that you will spare no effort to make the exhibit of the United States in the Paris Exposition creditable and productive of useful results to both countries.

I am, sir, your obedient servant,

T. F. BAYARD.

General WILLIAM B. FRANKLIN,
Washington, D. C.

CIRCULAR LETTER OF THE SECRETARY OF STATE TO GOVERNORS OF STATES AND TERRITORIES.

DEPARTMENT OF STATE,
Washington, July 3, 1888.

SIR: By a joint resolution of Congress, approved May 10, 1888, the Government of the United States accepted the invitation of the Republic of France to take part in an exposition of works of art and the products of the manufactures and agriculture of all nations, to be held in Paris, commencing the 5th day of May and closing the 31st day of October, 1889.

I have the honor to inclose herewith copies of the joint resolution referred to, and in accordance with its terms I would request you, by such methods as you may deem most suitable, to notify the people of your State to assist in the proper representation of the productions of our industry and of the national resources of our country. I would also suggest that you take such further measures as may be necessary in order to secure to your State the advantages to be derived from this beneficent undertaking.

The President, by and with the advice and consent of the Senate, has appointed General William B. Franklin as Commissioner-General to the Paris Exposition, and the office of the commission is now established at No. 35 Wall street, New York City.

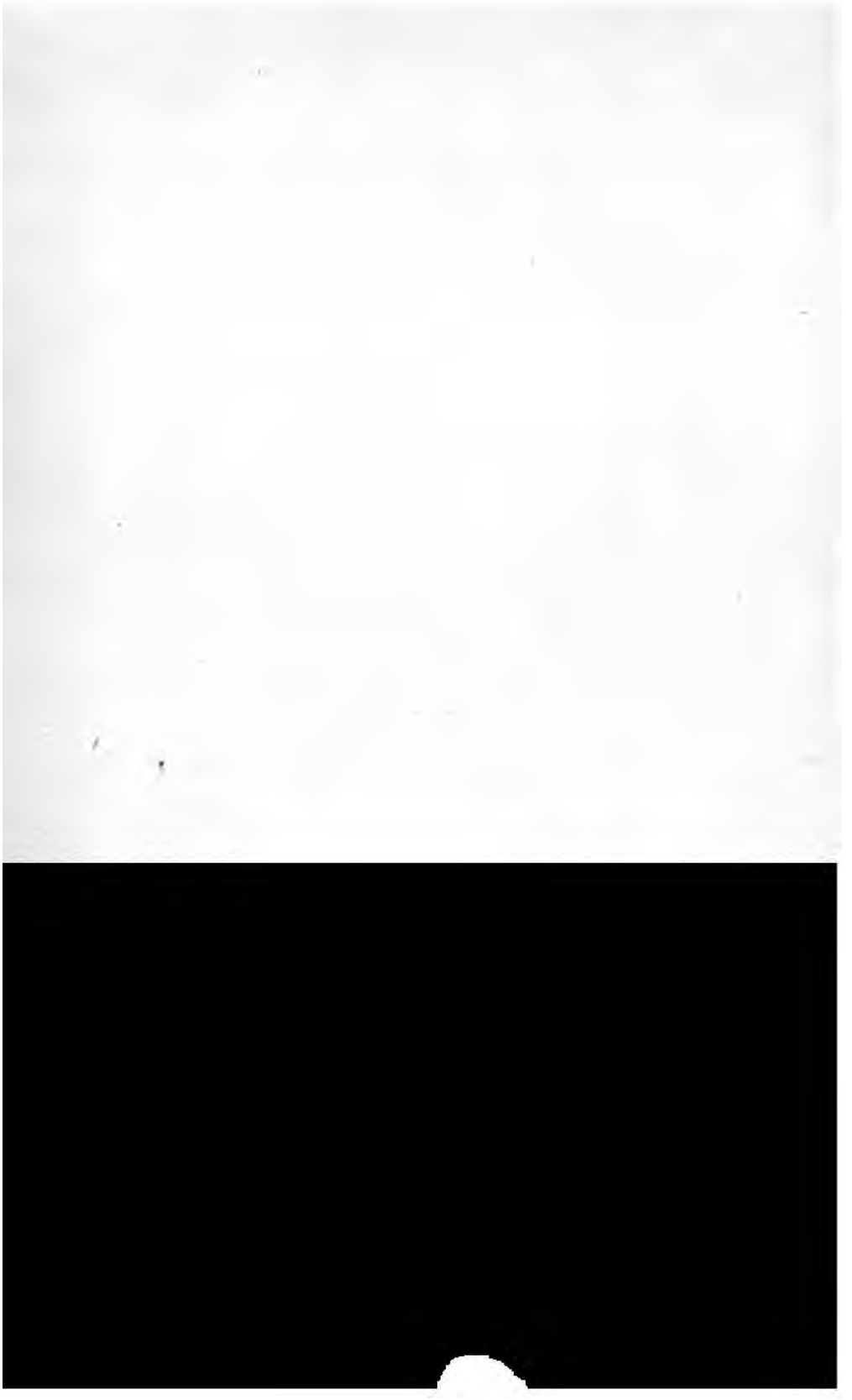
I have the honor to be, sir, your obedient servant,

T. F. BAYARD.

THE GOVERNOR OF ——.

(Inclosure: Public Resolution No. 11, approved May 10, 1888.)

A copy of this circular, with the necessary copy of inclosure, was sent to each of the States and Territories.



LETTER OF COMMISSIONER-GENERAL WITH ESTIMATE OF EXPENDITURE OF APPROPRIATION FOR EXPOSITION.

OFFICE OF THE UNITED STATES COMMISSION
TO THE PARIS EXPOSITION OF 1889,
No. 1 Broadway, New York City, N. Y., December 27, 1888.

SIR: I acknowledge the receipt of your letter of the 19th inst., relating to Mr. McLane's dispatch of the same date recommending a largely increased appropriation for the French Exposition of 1889, and asking for a general estimate of the amounts to be devoted to the objects of the Exposition authorized by my instructions of July 6, 1888.

I inclose the general estimate required. I have felt from the beginning that one of the most important of my duties, if not the most important, is to keep the expenditures of the commission within the appropriation. I have therefore taken little interest in attempts to get additional appropriation, although I think that had authority been given us to spend the balance remaining over from the appropriations for the Cincinnati Exposition, as recommended by the State Department upon my suggestion, the American department of the Exposition would have been more interesting on account of the presence of the Government exhibits. But I have no expectation that the money will be given.

I shall spare no efforts to keep the expenditures under the appropriation for the Paris Exposition of 1889 within the amount appropriated.

Respectfully yours,

W. B. FRANKLIN,
Commissioner-General.

HON. T. F. BAYARD,
Secretary of State, Washington, D. C.

Estimate of expenditure of the $250,000 appropriated for the Paris Exposition of 1889.

Salaries and clerk hire mentioned in the act	$43,500
To be expended in the United States for the agricultural exhibit	38,000
Expenses of New York office	7,500
Expenses of Paris office	5,500
Postage, express, telegrams, etc	1,000

For the preparation of space in the various buildings, installation of exhibits, and general expenses of each group, as follows:	
Art group, including boxing and partial insurance	7,500
Education, Group 2	7,500
Industrial, Groups 3, 4, and 5	9,000
Machinery, Group 6	8,000
Agricultural, horticultural, and food products, Groups 7, 8, and 9	5,000
Government exhibit	5,000
Freight	45,000
Stationery	2,500
Advertising	2,000
Watchmen and guards at the Exposition	10,000
Engineer, superintendents of sections, skilled labor, and extra clerk hire	12,000
Jurors	12,000
Preparation of report	10,000
Amount remaining for incidental and extraordinary expenses not above enumerated	19,000
	250,000

LETTER FROM THE COMMISSIONER-GENERAL.

OFFICE OF THE UNITED STATES COMMISSIONER-GENERAL,
PARIS EXPOSITION OF 1889,
Hartford, Conn., June 2, 1890.

SIR: I forward herewith my official report as United States Commissioner-General to the Paris Exposition of 1889, which is accompanied by supplementary reports and various appendices enumerated in the inclosed table of contents, the whole forming Volume I.

I submit herewith a memorandum statement as to the four other volumes, showing the number of articles, their titles and authors, and the estimated extent of each volume. Nearly the whole of the experts' reports are in, and those still in preparation will be in my possession by the end of the current month. While all of these reports are of interest, those still incomplete are of special interest, and the delay has been unavoidable. The estimate of number of pages, etc., is as nearly correct as it can be made.

I respectfully suggest that the information furnished in the accompanying schedule, compared and considered with the matter for Volume I as to character, scope, etc., will enable the Public Printer to form an intelligent and early estimate as to the cost of printing, etc., to aid the action of the Committee on Printing.

Respectfully yours,

W. B. FRANKLIN,
Commissioner-General.

Hon. JAMES G. BLAINE,
Secretary of State.

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Fine Arts	Gen. Rush C. Hawkins.
Education and Liberal Arts	Prof. A. J. Stace.
Technical Instruction	Prof. C. Wellman Parks.
Photographic Apparatus, etc	Prof. S. B. Newbury.
Optical Instruments, etc	Charles S. Hastings.
Instruments of Precision, Meteorology	A. L. Rotch.
Furniture and Accessories	David Urquhart, jr.
Textile Fabrics, etc	Prof. William H. Chandler.

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Preservation of Wood ..... Prof. William H. Chandler.
Hygiene, Public Charities, etc ..... Prof. William H. Chandler.

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Machine Tools ..... Prof. John H. Barr.
Knitting and Embroidering Machines ..... J. M. Merrow.
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Railway Plant ..... Prof. Lewis M. Haupt.
Civil Engineering, Public Works, and Architecture ..... Prof. William Watson.

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Horticulture ..... David King.

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MEDAL.

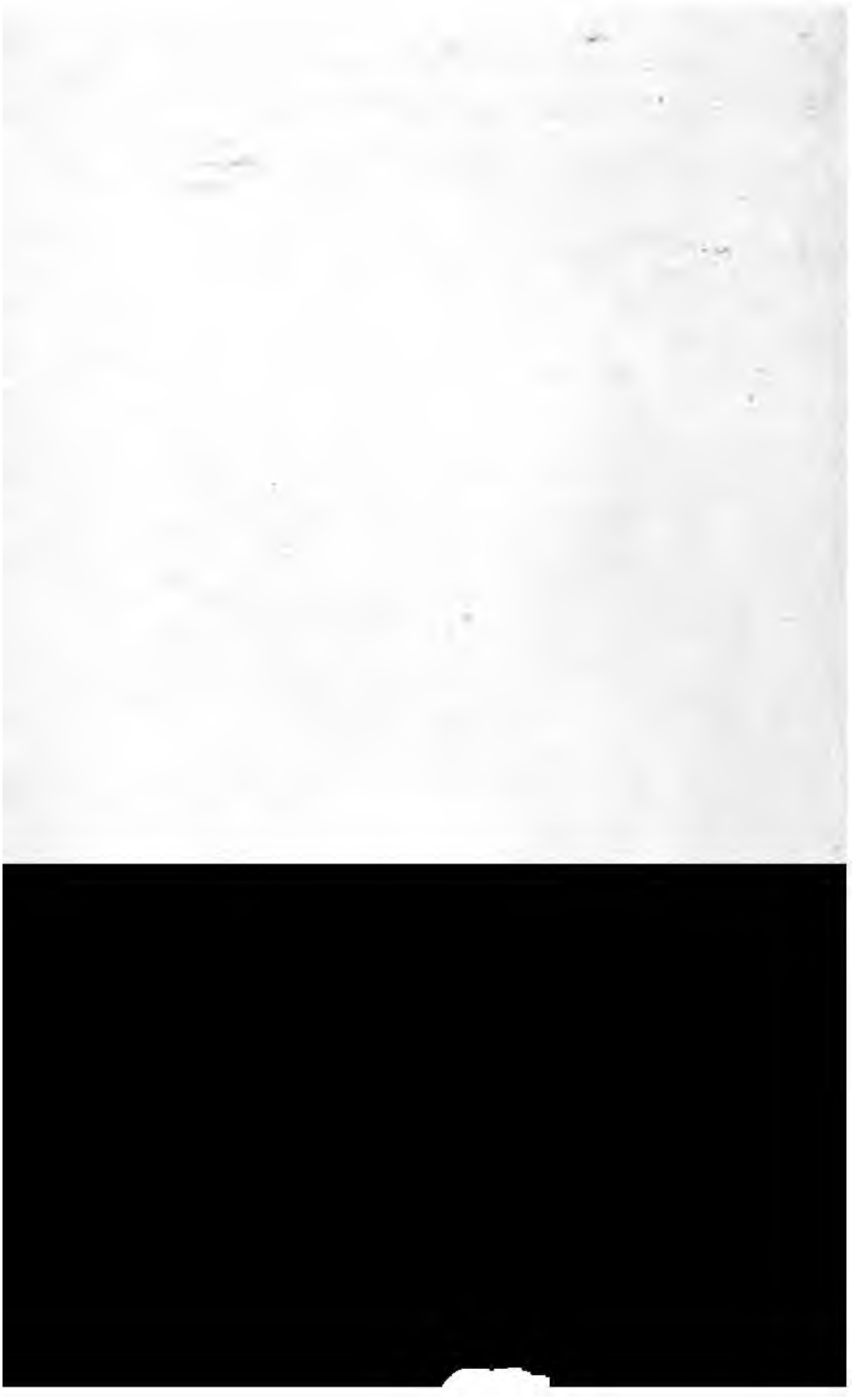
(Diameter of all medals 63 millimeters = 2.48 inches.)

Paris Exposition of 1889.

DIP

(Original 16.

1889
E FRANÇAISE
L'INDUSTRIE ET DES COLONIES
VERSELLE DE 1889
NAL DES RÉCOMPENSES
DIPLÔME DE
LE D'OR
l'éducation, Département de l'Intérieur,
D. C.)
ETATS-UNIS
GROUPE II — CLASSE 6
LE PRÉSIDENT DU CONSEIL
COMMISSAIRE GÉNÉRAL
PARIS
PARIS



REPORT

OF

THE COMMISSIONER-GENERAL.

OFFICE OF THE UNITED STATES COMMISSIONER-GENERAL,
Hartford, Conn., June 2, 1890.

SIR: I respectfully make the following report upon the Paris Exposition of 1889, and the results thereof, as required by the joint resolution of Congress approved May 10, 1888, and more distinctly specified in the instructions of the Secretary of State, dated July 6, 1888.

The Paris Exposition of 1889 was instituted by the French Republic on November 8, 1884. The decrees authorizing it fixed the days of opening and closing as May 5 and October 31, 1889, so that the duration of the Exposition was to be the same as that of the Paris Exposition of 1878. The dates of opening and closing were afterwards made May 6 and November 6, 1889. Preliminary work was at once started, and a commission was organized under the presidency of Mr. A. Proust, Minister of Instruction and Fine Arts. On March 14, 1885, this commission reported that the approaching Exposition will give a résumé of the progress of enfranchised labor from 1789, an economic as well as political starting-point, through the century that has elapsed. All nations are invited to an examination of the present economic situation.

The work of the Exposition really began, however, in the early months of 1886. In March, 1886, it was determined that the whole cost should not exceed $8,600,000, and that of this sum the French Government should contribute $3,100,000, the city of Paris $1,600,000, and the remainder should be raised by a guaranty association to which the proceeds of the sale of

tickets at 1 franc (20 cents) each were hypothecated for the sum of $3,600,000. In July, 1886, the Minister of Commerce was made Commissioner-General of the Exposition, Messrs. Alphand, Berger, and Grison were made Directors-General, respectively, of Works, Management, and Finance, thus placing it under the fostering care of a department of the Government, and securing the best technical, administrative, and financial abilities in France for the Exposition. From this time its success was assured, and until the opening of the Exposition nothing interrupted the distinguished ability and energy with which every detail of the work was done.

ORGANIZATION.

In August and September, 1886, committees were formed by direction of the Commissioner-General in all of the departments of France, assisted by sub-committees in the various cities and towns. The prefects and sub-prefects were the presiding officers of the committees, and the members were the principal manufacturers of the districts and other noted persons, presidents of scientific and social societies, etc. These committees were required to do everything in their power to make the Exposition known to persons likely to exhibit, and to induce manufacturers, museums, art galleries, and scientific and social

recompenses. These last two committees acted as courts of appeal from the decisions of the class committees. The result of all this organization was that all questions that could arise among exhibitors were finally settled before the opening of the Exposition, and the work of installation was made comparatively easy to the administration, avoiding all friction and undue haste.

On April 6, 1887, Mr. Th. Roustan, minister to the United States from the French Republic, informed the Secretary of State of the United States that the Exposition would be held, and that he was instructed by his Government to invite the co-operation of the United States. It may be noticed that this letter is dated about one month after the adjournment of Congress, so that nothing could be done to accept the invitation thus conveyed until after the meeting of the next Congress in December, 1887, and much valuable time was thus lost.

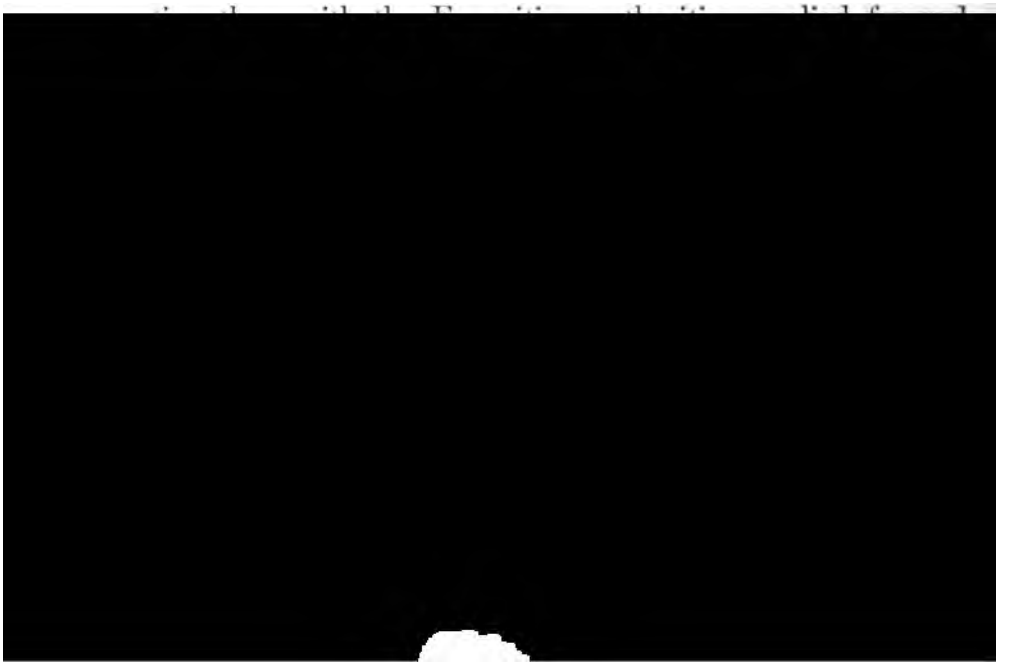
On April 13, 1887, Mr. Bayard, Secretary of State, acknowledged the receipt of Mr. Roustan's letter, and informed him that the matter would be brought to the attention of Congress at its next session, and on January 12, 1888, the President of the United States referred the matter to the attention of Congress, transmitting Mr. Bayard's report and recommendations. On May 12, 1888, the act accepting the invitation of the French Republic was approved, more than one year after it was given. This act, after accepting the invitation, requested the governors of the States and Territories to invite their people to assist in the proper representation of the products of our industry, and other national resources, and to take other necessary measures to secure to them the advantages to be derived from this beneficent undertaking."

It directed the President to appoint a Commissioner-General and an assistant, and defined their duties. It authorized him to appoint nine scientific experts as assistants to the Commissioner-General, who should be assigned to the nine groups into which the Exposition was officially divided, and should make reports thereon, and fixed the compensation of all these officials. It appropriated $250,000 to defray all expenses connected with the Exposition, to be expended under the Secre-

tary of State. It also authorized the Commissioner of Agriculture to collect and prepare an exhibit of the agricultural products of the United States for the Exposition, with a report to be printed in English, French, and German, and finally directed that all reports of the Exposition, and a detailed statement of the expenditures, should be transmitted to Congress.

Under this act, on June 21, 1888, the undersigned was appointed Commissioner-General, and Mr. S. P. Tuck, Assistant Commissioner-General. Detailed instructions for the guidance of the Commissioner-General were made, dated July 6, 1889, and immediately afterwards the duties of preparing the exhibit for the Exposition were begun.

A circular letter to the governors of the States and Territories, calling their attention to the law and to the invitation extended to their peoples, was written by the Secretary of State. The result, however, was discouraging. Few responses were made to this letter, and with one or two small exceptions no State or Territory made any exhibits; but many of them appointed commissioners from their States to the Exposition. Under the authority for appointing such clerical assistance as might be required, a secretary, Mr. A. Bailly-Blanchard, of New Orleans, was appointed at once. He was at this time resident in Paris, and immediately placed himself in communi-



experience and industry were of the greatest value to the United States exhibit.

An office was at once opened in the city of New York, and the work of advertising, collecting, and distributing information, answering inquiries, printing and distributing blanks, sending persons to induce manufacturers to make exhibits, and, in some cases, to procure exhibits by purchase when they could be obtained in no other way, was commenced, and was kept up without intermission in New York until the exhibits were collected and shipped to Havre.

There was also a brisk correspondence held with the secretary in Paris, who was our only means of communication with the Exposition authorities. Through him, with the powerful aid of Mr. McLane, the minister of the United States, we obtained an important addition to our space in the Palace of Machines, and were authorized to use engines made in the United States to give the motive power to our machines of all kinds exhibited in the Palace of Machines. The French Exposition authorities had made a contract with English and French houses, not only to deliver all steam that would be required for engines to run the various machines exhibited which required power, but also for the engines themselves, thus throwing out all engines manufactured in the United States from opportunity of working their own exhibit. This contract was modified by the French authorities after a long correspondence, so that the United States exhibit was worked entirely by engines built in the United States.

All regulations necessary for the full understanding of the duties and rights of the United States as an invited guest at the Exposition, the drawings and other information to enable the employés of the United States to place and set up the exhibits, the arrangements made with transportation companies, in fact, everything that was required to make our work easy, were transmitted as early as was possible under the circumstances.

COLLECTION AND SHIPMENT OF EXHIBITS.

During the summer of 1888, a large Centennial Exposition was held in Cincinnati. It was well endowed by the United

States, and many persons and firms who would have been likely to make exhibits in Paris in 1889 exhibited there, and considered it extravagant to make another exhibit less than one year thereafter. An International Exposition was also in progress in Brussels at the same time. The citizens of the United States who exhibited there were, in general, adverse to the longer stay abroad required by the Exposition of 1889.

The presidential campaign went on during the same period, and the interest taken in it absorbed the attention of business men to the exclusion of nearly everything else. Then, too, there was a suspicion—unfounded, it is true—that there was a certain instability in the existing state of politics in the French Republic, which might cause great excitement in Paris before the close of the Exposition, and embarrass foreign exhibitors. Midsummer is a bad time of the year to begin the collection of an exhibit for an Exposition. The heads of firms and companies are, in general, taking vacations, and prefer to postpone business questions until fall.

For these reasons the work of collecting exhibits during the summer was slow and unsatisfactory, and few applications were made before October and November. But immediately after the presidential election, applications for space came in vigorously, and by the end of November they covered more than

The collection of the Art Exhibit from the United States (Group I) was under the direction of General Rush C. Hawkins, of New York, known as a connoisseur in art, the assistant commissioner expert assigned to Group I. He, with my authority formed a committee of seventeen artists nominated by the leading art societies of the United States, and with their assistance selected those paintings and other works of art which complied with the requirements of the French authorities and were considered worthy of exhibition as specimens of the arts in the United States. This collection was supplemented by another made from paintings and sculpture of artists, citizens of the United States, residing abroad, and exercising their art there. The leading artists among these had formed a committee of artists in Paris, the duty of which was to look after the interests of the United States art exhibitors at the Exposition, residing in Europe, and to do what was in its power to make the exhibit creditable to the United States. General Hawkins arrived in Paris to organize the exhibit in March, 1889, and immediately obtained the assistance of the committee. With its advice the collection of the United States works of art executed abroad was made, thus completing the exhibit.

The exhibits in Groups II to VII, inclusive, were collected and organized in the office in New York under Mr. Tuck, assistant commissioner-general, and Mr. Gunnell, chief engineer, assisted by Prof. W. C. Blake, Prof. C. Wellman Parks, Rensselaer Polytechnic Institute of Troy, N. Y., and Mr. T. R. Pickering. The assistant commissioner experts of these groups were all engaged in their own private work until just before the opening of the Exposition. All of them were professors in universities, except Mr. A. Howard Clark, of Boston, who was a technical assistant of the Smithsonian Institution. All were technically well informed on the groups to which they were assigned by the law.

The collection of the exhibit of Group VIII was by the law assigned to the Department of Agriculture, Hon. Norman J. Coleman, secretary. He assigned one of the experts of that department, Prof. C. V. Riley, to the work. Professor Riley

was appointed assistant commissioner expert for that group. He conducted the collection and organization with great skill, and was ably assisted by other experts attached to the Department of Agriculture. The result was an agricultural exhibit second to none at the Exposition in variety and interest. Its size was small for obvious reasons.

The reports required by the law on the agriculture of the United States were prepared by experts belonging to the Department of Agriculture. They were translated into French at Paris, and thousands were distributed from the exhibit, and the greatest interest was shown in them. It was impossible to have them translated and printed in German in Paris, and none could have been circulated there had they been printed in German. A number of copies of the French translation were sent to the minister of the United States at Berlin, and were distributed by him to the German agricultural officials.

In Group IX the United States had a very small exhibit. The principal work, therefore, of the expert assistant commissioner of this group was the preparation of the report on the state of the art of horticulture, as shown by the Exposition.

EXPOSITION GROUNDS AND BUILDINGS.

The grounds of the Exposition were the Champ de Mars,

French industrial products close to it. The length of these buildings takes up the whole breadth of the Champ de Mars. The upper horizontal member contains the foreign exhibits and the French Exhibit of the Liberal Arts. The lowest horizontal member also contains foreign exhibits, and the exhibit of the Fine Arts. The short middle member is the nave of the industrial building, and at its extremity is its main dome. The details can only be properly shown in the plans and in expert reports.

OPENING OF THE EXPOSITION.

By Monday, May 6, the date of the formal opening of the Exposition, the whole of the United States Exhibit, with some insignificant exceptions, was in place. Much, however, remained to be done in the other sections, French as well as foreign.

At the ceremony of the opening, the grand central dome was filled with seats occupied by the senators and members of the Chamber of Deputies of France, by its judges, high officers of the army and navy, the members of the diplomatic corps, and the commissioners-general of the exhibiting nations, and their assistants. In the upper galleries, the ladies who were invited to the ceremony were seated.

The President of the Republic, Mr. Carnot, arrived at the designated hour, two o'clock. He was escorted by troops, saluted with twenty-one guns, and on his entrance to the tribune in the dome was greeted with the Marseillaise, sung by men's voices and accompanied by a military band. Mr. Tirard, prime minister, and Commissioner-General of the Exposition, received him, and read an address. In it he recited the difficulties that had been overcome in bringing the Exposition to so triumphant a beginning. He continued:

Although this munificent result exceeds all hopes, there is nothing in that should astonish us; progress never goes slow; new generations constantly replace forces which are exhausted or have disappeared; science—sovereign power of our century—does not stop the course of its contests, every day it penetrates farther into the secrets of nature; steam and electricity have already revolutionized the economic order of the universe. Who can tell the prodigies and surprises

they still hold for us and our descendants? Inventions, discoveries, improvements succeed each other with stunning rapidity; nothing can resist this enormous push forward; mills, work-shops, factories, stimulated by competition, encouraged by success, undergo constant transformations, upon which we can congratulate ourselves, since the result is an abundance of things necessary for life, the lessening of their prices, and consequently the increase of the general welfare.

After reciting the obligations of agriculture to science, congratulating the French artists on their progress, thanking the foreign commissioners and the representatives of the French colonies, he ended by saying:

Let us receive and joyfully entertain the foreigners who are already crowding here; let us prove to them that Republican France is hospitable and generous; that she loves and honors the workmen of all nations, and sees in them, not rivals of whom she is jealous, but fellow-workmen who labor with her for the happiness of humanity and the peace of the world.

The answer of the President of the Republic was able and dignified. In the course of his speech he said:

To-day France glorifies the dawn of a great century which has opened a new era in the history of mankind. To-day we contemplate, in its brilliancy and in its splendor, the work born of this century of labor and of progress. We salute the workmen of the whole world, who have brought here the fruits of their labors and the productions of their genius. We tender a friendly hand to all those

the faithfulness and science that they had shown in their work, he ended:

And now, gentlemen, we are going to visit together the treasures which the world has accumulated in these palaces and these gardens, giving to our country so splendid a testimony of confidence and sympathy. After having again wished a cordial welcome to the guests of France, I declare the Exposition of 1889 open.

During these ceremonies an enormous and very enthusiastic crowd had gathered, rendering progress slow and difficult, but the President, accompanied by a brilliant following, went over all important parts of the Exposition. When he arrived at any foreign exhibit he was received by its commissioner-general and his staff, and in the case of the United States Exhibit—in which he spent more time than he did in any foreign exhibit—he was also received by the detachment of Marines, which formed an efficient barrier to the crowd. In the evening the grand dome of the Exposition, the Eiffel Tower, and the buildings of the Trocadéro were illuminated with thousands of gaslights, giving a magnificent specimen of an art in which the French are unequalled. The illumination lasted until about 11 p. m., when it was extinguished, and the crowd dispersed. Thus ended a day which by its great success alone would have assured the future triumph of the Exposition, had such assurance been necessary.

OFFICIAL CATALOGUE.

During the month of May the Exposition was finally completed. The Official Catalogue of the United States was finished and printed during the month. This work had been commenced in New York by Mr. Tuck, Assistant Commissioner-General, assisted by Professor Blake. It was completed in Paris, with the able assistance of Mr. A. Howard Clark, who devoted much intelligent labor and time to it. The "Information for the Jury" was collected and translated for the exhibitors and made ready for the juries. This work was in no respect one of the duties of the Commission and should have been done by the exhibitors, but in a great many instances the

mere fact that the article was exhibited and its name placed in the catalogue was considered sufficient.

This was a serious omission, and had it not been made good by the Commission would have been the cause of vital damage to the United States Exhibit in the matter of awards. Without this information the juries would have been unable to make any serious examination of the exhibits, and the articles would have been considered out of competition. With all important French and foreign exhibits, except those of the United States, the exhibitors had at their own cost prepared printed or lithographed accounts of their exhibits and of the works at which they were made, translated into French and accompanied by blue prints or engraved illustrations, giving, too, the names of the principal workmen who had been engaged in getting up the exhibit. This list of names was important, as the juries awarded medals in many instances to the persons named, showing their appreciation of the skill and industry exercised by these workmen.

In any international exposition hereafter, no exhibit should be received, or in any event be considered complete, unless it be accompanied by a detailed description of the articles exhibited, with an account of the works, their size, number of persons employed, etc., and a list of persons who, in the

that the exhibit in general was very creditable, and that in particular the machinery and agricultural exhibits did honor to the country. As for the electrical exhibits, including the telephone, phonograph, and graphophone, they far excelled anything similar at the Exposition; in fact, they may be said to have been unique. The United States Section received high praise from the President of the French Republic, the ministers who visited the Exposition officially, and from the jurors. The general appreciation of it is shown by the long list of prizes, a large proportion of which were high ones, awarded by the juries. This list is appended to this report.

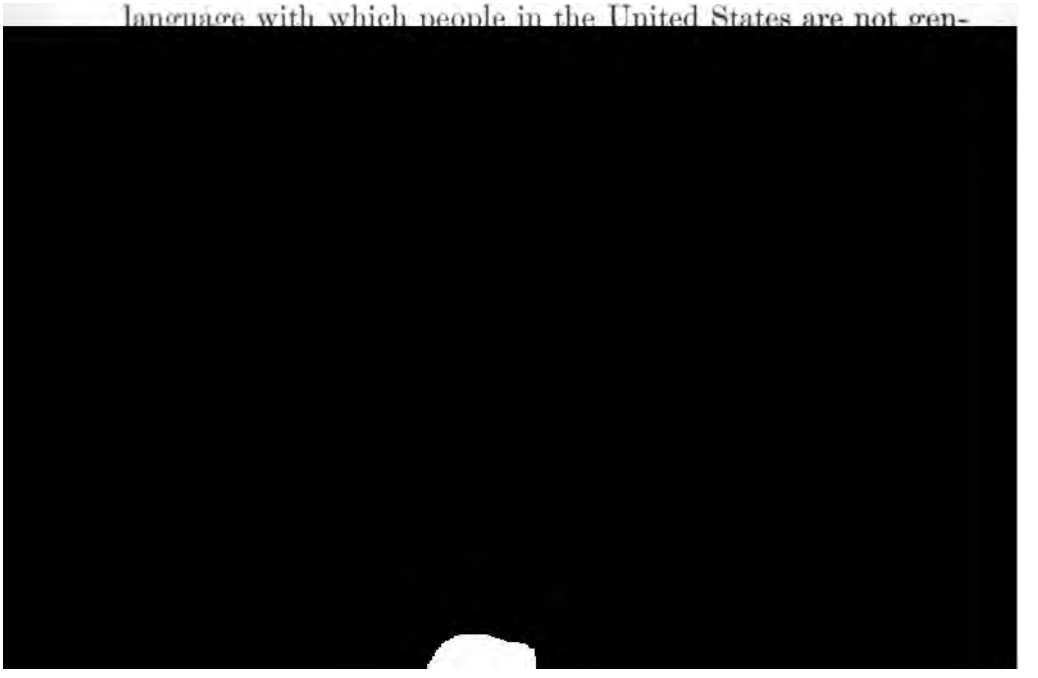
JURIES.

The most important duty of the Commissioner-General in Paris was that connected with the selection of the jurors allotted to the United States, and the proper submission of the objects exhibited to the juries for their investigation. The total number of the titular class jurors, French and foreign, was fixed at one thousand, and that of the supplemental jurors at three hundred and thirty-three. These numbers were slightly increased afterwards. The titular jurors had votes, but the supplemental jurors were not allowed to vote except where the titular jurors were absent, when the supplemental jurors took their places. The number of titular jurors assigned to any nation, and to each branch of art or industry, was dependent upon the number of exhibitors and the importance of the exhibits. The number of supplemental jurors allowed was about one-third of the number of titular jurors.

The exhibit of the United States was allowed sixty jurors, forty-four of whom were titular and sixteen supplemental. The French jurors of both kinds were nominated by presidential decree on the proposition of the Commissioner-General, Mr. Tirard. They were selected from the citizens of France most distinguished in the specialties which they were to examine, and from those who had obtained high recompenses in the international expositions which had been held previously.

The foreign jurors were designated by the commission of the country represented. In the case of the United States, it

was impossible to select the jurors in the United States. It was not known until after the opening of the Exposition how many United States jurors would be allowed, and until the number was known it was impossible to determine to what classes they should be assigned, the number of titular jurors allowed being about one-half the number of classes to be investigated. It was necessary, therefore, to utilize all members and employés of the United States Commission who had any technical knowledge, and who could be spared from their ordinary duties. Some State commissioners served, also a very few persons of technical knowledge came from the United States to serve, and the remainder were selected from citizens of the United States resident in Paris, whose occupations were likely to have given them the required technical knowledge. The Commissioner-General was authorized by the law to determine the pay of the jurors; but to have paid anything commensurate with the labor and time required by a juror who did his duty would have absorbed at least one-fourth of the appropriation for the whole United States Section. It was impossible, therefore, to hold out the inducements necessary to take able men from their work at home to come to Paris to undertake a long and tedious work among strangers, the deliberations and business being carried on in a language with which people in the United States are not gen-



Commissioner General, and explanations were then made and instructions given by Mr. Berger, the Director-General of Management. Each jury at its first meeting chose a president, vice-president, a reporter and a secretary. The president and vice-president were to be, one French, the other foreign, and eight vice-presidents were chosen from the jurors of the United States. The office of reporter is not used with us. His duties seem to be to keep such a record of what is being done that no time shall be lost in determining the next business, and his record will always give to the members of the jury information of the state of the work. He is the journalist of the jury, and to that degree performs the work that is done by a secretary with us.

The juries began work at once. They worked steadily at all available hours, until everything exhibited for competition was examined. I have never seen such honest, conscientious, hard work as was done by this large number of distinguished men, who served without pay. Their reward was the appreciation by their countrymen and foreign exhibitors of their disinterested labors, and the consciousness—which they have a right to hold—that no body of men ever performed a delicate and laborious task with more industry, with greater ability, and with a better sense of justice to all. Their work was finished by the 25th of July. At this date the group juries met. These juries were composed of the presidents, vice-presidents, and reporters of the class jurors. Each group jury had a president, vice-president, and reporter, who were named by presidential decree on the nomination of the Commissioner-General, except in Group I, whose officers were nominated by the Minister of Public Instruction and Fine Arts. Three vice-presidents of group juries were taken from citizens of the United States. It was the duty of these juries to go over the awards made by the class juries, and make such changes in the number and grades of awards as they thought proper. When the result of the work of any class jury was before the group jury, the members of the class jury had a right to be present and to be heard.

The deliberations of the group juries were finished in the

early part of August. The superior jury met on August 26. Its honorary president was the Commissioner-General, and the honorary vice-presidents were the Minister of Public Instruction and Fine Arts and the Minister of Agriculture. It was composed of eighty members, forty French and forty foreign. The French members were the principal officers of the Exposition, the members of the superior committee of revision, the presidents and vice-presidents of the group juries, the president of the special jury on social economy, the chiefs of cabinets of the Commissioner-General, and of the Ministers of Instruction and Fine Arts and of Agriculture. The foreign members were the commissioners-general of countries which had more than five hundred exhibitors. The United States, therefore, had four members of this jury, but only three were present, the fourth having been obliged to return to the United States after the first meeting of the jury. It was the duty of this jury to examine the findings of the group juries, and finally, and as a court of last resort, to determine the lists in each class in the order of merit of the recompenses which should be awarded to exhibitors. The first meeting of the jury was opened with a speech from the Commissioner-General, supplemented by a report from Mr. Berger, Director-General of Management. The jury was too large to act as a unit, and a sub-commission (committee) of twenty-five members of the jury, composed of the

writing. Then any foreign commissioner-general, or some one appointed by him, could state complaints verbally, and after the investigation considered necessary by the committee, the decision was made. In cases in which the group and class juries agreed upon a particular award, the question was considered closed. These reports embodied the final action of the group juries as to awards to be made, and were discussed fully by the committee. The discussions were able, as may be inferred from the composition of the committee. As was stated by Mr. Berger, Director-General of Management:

> Had it been possible to place in permanent form the elevated sentiments that were exchanged, to describe the great industrial, economic, and artistic questions that were treated in the course of the discussion, with wonderful breadth, the Exposition would leave after it one document more to attest the value of the men who have figured in its juries.

The report of this committee was made to the jury on September 11. After a short discussion it was unanimously adopted by the superior jury. A report from Mr. Berger gives a succinct account of the work of the committee. A translation of it is appended.

PUBLICATION OF AWARDS.

The number of recompenses of all degrees awarded was 33,138. This enormous list was immediately classified and printed, and was ready by September 29, the date of the formal publication of the awards. This ceremony, which was attended with great dignity, took place in the Palais de l'Industrie, in the large apartment that takes up the whole ground floor. The magnificent room was highly ornamented with tapestries and banners arranged with exquisite skill, and was filled by fifteen thousand persons, men and women, seated, well dressed, and in general connected in some way with the Exposition. The south end of the room was taken up by an ascending stage, upon which were displayed the standards of France and her colonies, supported by natives in their national dress, and to these were afterwards added the standards of the foreign nations that took part in the Exposition, supported by their

guardians. This arrangement formed a magnificent tableau vivant, and the best artistic and architectural skill at the command of the Exposition contributed to its success. On the right of the stage was a large tribune, in which were seated the President and cabinet, and near them were Madame Carnot and other ladies. In front of the President were seats for senators, deputies, judges, members of the Institute, and other officials, all of which were well filled by persons in official dress. From the end of the room opposite the stage, a grand stairway descended to the floor, and from the top of the stairway the procession appeared, moving towards the President. This was made up, first of the commissioners-general and their staffs and assistants of the foreign nations, in alphabetical order, escorted by their guardians, all in full dress. They made a brilliant show, and the fine appearance of the marine detachment caused the United States procession to be received with a great burst of enthusiasm. Second were specimens of French soldiers, of marines and sailors, representing the war and navy departments. Third came the representatives of the nine groups into which the Exposition was divided, with characteristic banners representing artistic and industrial France. Then came the representatives of the colonies, and last of all, the members of the Institute of Fine Arts.

valuable help, which had in so great a degree contributed to the success of the Exposition. He continued:

The splendors of modern art and industry have not only gratified the eyes of visitors: they lead to study, they solicit comparisons, they excite ideas, they disseminate germs of progress in the world of labor, they engender fruitful efforts for improving the means of production. Thus the Exposition of 1889 will perpetuate itself. It will bear other fruits no less precious, by popularizing the latest conquests of industrial mechanics, the fittest processes for guaranteeing the safety of the workmen and the healthfulness of the shop, by calling attention to the methods of instruction in all countries, above all to the methods of technical instruction, inseparable from the liberty of labor.

The Exposition has not been merely an exhibition of things: it has been an exhibition of ideas. The international congresses, to which eminent men of all countries have contributed their ideas upon science, art, letters, economic and social questions, will leave the most precious documents. An entire group of the Exposition, specially devoted to social economy, has collected priceless treasures of information upon production and the methods of making it easier. Here has been shown the glorification of the work of 1789, the emancipation of industry, and a complete picture of one of the greatest economic and social revolutions of humanity. Such richness, gentlemen, will form a mine precious to explore at this time, when more than ever the study of all questions relating to work, to production, to credit, to association, and to savings is upon us; now, when the examination and defense of our commercial interests require, equally, vigilance and coolness, at the very moment when patriotism, with peace within and without, with agreement among our citizens, demands a practical and productive policy. If the Exposition of 1889 opens to our country this era of pacification and work, it will have borne the fruits that patriots expect of it. Its benefits will not stop at our frontiers. The guests whom France has welcomed with joy, and from whom she will not part without regret, will have learned to know her. The enlightened opinions that they will have, the feelings with which they will return to their own countries, cannot be without effect upon the relations between the peoples. The policy to which France is faithful will have found new defenders, and the Exposition of 1889 will have again served the great cause of peace and humanity.

The President was followed by Mr. Tirard, president of the Council, Minister of Commerce and of Industry, Commissioner-General of the Exposition. He referred to the pride which all Frenchmen justly felt on account of the signal success of the

Exposition, to the badly founded fears of failure to which superficial political agitation had given rise, to the appropriateness of the date of the opening of the Exposition—

Placing in relief the enormous and constant progress realized in all branches of human activity since that memorable epoch which saw ancient privileges, the oppression and abasement of the people, disappear, to give place to the emancipation of labor, to free property in the soil, to the right of all citizens to hold public office, to civil equality, and to the obligations of all to the law. This coincidence of the celebration of the centennial of the Revolution of 1789 with a great international exposition is not then, as seems to have been believed, a sterile political manifestation, but is really the demonstration of the power and vitality of a free nation, which, faithful to the traditions of its race, is constantly laboring to ameliorate the lot of the citizens who compose it. In fact, the expositions of the present day are not what they were at their origin, enormous markets, having no other object than a trade in merchandise: these expositions—and that which now occupies us, abundantly proves it—have a more extended and higher range. They show, not only new or improved products, new inventions or discoveries, but also efforts, attempted or successful, which have for their object the increase of general well-being.

He then gave a general sketch of the various exhibits of all kinds, laying particular stress upon the great improvement in technical or professional education of young men and young women who wish to learn trades. "To properly appre-

Besides, 5,500 medals of various kinds were awarded to "collaborators," workmen who were noted for skill and ability and faithfulness in the work-shops in which the exhibits were prepared. He also stated that, as every exhibit had merit, it was proposed to present to all exhibitors not mentioned in the above lists commemorative medals. He then cordially thanked all persons connected with the Exposition, whether as officers, or exhibitors, or foreign commissioners, for their valuable assistance in making a success of the Exposition. He ended as follows:

We shall wisely and resolutely continue the work of 1889 without permitting the constantly recurring exactions of new ideals to weary and discourage us. We will remember that the social reforms dimly seen by our fathers, and whose outcome we realize, are obtained neither by surprise nor by violence, and that to produce sure and durable results, they must be patiently and progressively attained. Thus, gentlemen, will France continue its ascending march in the direction of progress and civilization, with the worship of liberty, with the love of labor, which is to-day the master of the world.

After Mr. Tirard had finished, Mr. Berger, the Director-General of Management, read the names of those who had received grand prizes, and the printed copies of the lists of awards were presented to the representatives of the nine groups. Then, after music, the assembly dispersed.

It was the design of the Exposition authorities to show that the republic of to-day, without aid from royalty, could make as impressive a final display as any that had been made previously at any other exposition. Its success was signal, and all who were present at the distribution of awards—which may be considered the closing ceremony of the Exposition—came away convinced that they had never witnessed a more dignified, more impressive, or more beautiful spectacle.

PACKING OF EXHIBITS.

After the publication of the awards the official connection between the French administration and foreign commissions virtually ceased. The Exposition went on as usual during October and up to the 6th of November, when it was quietly closed without any ceremony. The work of demolition and

of taking down and packing exhibits began on the next day, and in an incredibly short time the beautiful halls of the Exposition buildings became scenes of, apparently, dire confusion. But as the goods were gradually packed and removed order soon sprang up again, and by November 30 everything was ready for shipment. But the shipment was a tedious and difficult work. The French custom-house authorities insisted upon placing leaden seals on each package to avoid danger of fraud, and exacted formal declarations covering each exhibit. The time required to comply with these regulations caused our shipments to extend over a space of three weeks longer than would have been necessary had our official labels been considered sufficient guaranty of good faith.

CONGRESSES.

No less than seventy international congresses sat at Paris between the 12th of June and the close of the Exposition. The list which is herewith given shows the great variety of subjects which were discussed. Although the honorable Secretary of State and myself were asked to designate persons from the United States to sit in these congresses, we had little success in getting them. A few came from the United States to attend them, but they were not detailed officially, and there

an enormous collection of advertisements. The goods are there displayed to show their merits, their advantages over the same classes of goods in their own and foreign countries, and the exhibit is arranged to catch the eye of the visitor, as the show windows of shops are ornamented to attract those passing in the street.

There would be little inducement for manufacturers to make exhibits unless they expected to increase their sales by them. The fact that the exhibits were in general so fine in the Exposition of 1889 is good evidence that manufacturers have reaped benefits from former expositions. Nevertheless, there is a certain sameness, almost amounting to monotony, in industrial exhibits of ordinary fabrics and machines in all expositions.

(2) The instructive department. The exhibits in the Exposition of 1889 which were intended to throw light upon subjects for study, like those of the history of work, the history of human habitations, social science, the exhibits from the various official departments, that of the city of Paris, and many others too numerous to mention, exceeded in their variety, the skill of their arrangement, the scientific, technical, and historic knowledge shown in the descriptive catalogues, anything of a similar kind that has ever been shown in any exposition. A visitor interested in any of the subjects treated, who would make a thorough examination of the exhibit of his subject, would obtain a fund of information that would amply reward him for the time taken, and which he could get nowhere else in as compact a shape.

A short résumé of the history of work has been prepared by Col. Wickham Hoffman. It is appended to this report. The same gentleman has also translated information on the Social Science Exhibit, which may almost be considered a newly discovered group. It was arranged in fifteen classes, under the direction of Mr. Léon Say, the president of the jury of the new group, whose distinguished reputation as a social scientist is well borne out by the great success of the exhibit. This translation is also appended to this report.

One of the most interesting exhibits in the history of labor is contained in the war department building on the Esplanade

des Invalides. It is a collection of armor and arms belonging to Mr. William H. Riggs, a citizen of the United States resident in Paris, and is one of the most complete, if not the most complete, private collection of the kind in existence. It brings the history of armor down from the first use of metallic armor until it was discarded, and of arms from bows and cross-bows to modern fire-arms. Mr. Riggs has spent many years and an enormous amount of money in bringing the collection to its present state of perfection. There are many objects in it, too, of great historic interest, all, however, belonging to the subject of armor and arms. It is very large, and although the room in which it was contained was at least sixty by forty feet, and was well filled, only about two-thirds of the collection could be exhibited for want of space. Unfortunately, Mr. Riggs was unable to catalogue the collection on account of serious illness, so that it is only mentioned in the French official catalogue without any description.

The subject is mentioned here because it is the intention of Mr. Riggs to present the whole collection, without exception, to the National Museum at Washington, provided the United States will furnish a fireproof building for it, with means for its care and preservation, and call it the Elisha W. Riggs Collection; this was the name of his father, who was a citizen of the District of Columbia. He was too ill to attend to the

of the United States resident in Paris, and a correspondent of the Smithsonian Institution and the National Museum, which gives a general statement of the contents of the collection.

(3) The amusement department. No exposition has ever contained within itself so much to interest and amuse every class of visitors as that of 1889.

During the day the Eiffel Tower, about one thousand feet high—which was ascended by elevators, a combination of French and United States inventions—had at its foot a line of thousands awaiting their turn at the cage of the elevator. Those who came as late as ten o'clock in the morning were obliged to wait for hours, but if the day was clear they were amply repaid by the view from the top for the time lost. At the height of about three hundred and twenty feet from the ground there was a platform, on which were built restaurants which were much frequented, and this platform was a favorite stopping place.

The grounds of the Trocadéro were devoted to the display of flowers, trees, and fruits. They were an endless source of amusement to visitors. The grounds, lawns, and flower-beds on the Champ de Mars were kept in beautiful order, constantly renewed, and with the numerous fountains on the grounds, which were of great beauty and were in full view from the large restaurants which skirted the sides of the buildings, the visitor was constantly interested. During the whole time of the Exposition there was music by excellent military bands in the grounds of the Champ de Mars every afternoon. Various theaters on the Champ de Mars, where light pieces were performed for a small price of admission, were in action day and night, and several eastern theatrical dancing exhibitions could be seen at any time in the Rue du Caire, on the Champ de Mars, or on the Esplanade des Invalides.

The grand dome of the Exposition and the Palace of the Trocadéro, at opposite ends of the great inclosure, were illuminated, and the colored fountains of the Champ de Mars played every evening; on Sunday evenings and on the evenings of fête-days, and other grand occasions, like that of the visit of the Shah of Persia, the Eiffel Tower was also illuminated,

and the illumination of the Trocadéro Palace was made more general. At least two tickets were required for admission after six o'clock of the afternoon, except on Sundays, when but one ticket was required. On great occasions the price was raised to five tickets, and on the occasion of the Shah's visit to ten tickets. It is a well-known fact that the French excel all other people in the art of ornamental illumination. Every detail connected with the illumination of the Exposition buildings, fountains, and grounds was elaborately worked out, so that it may easily be imagined what a source of interest and pleasure these nightly illuminations were to the hundreds of thousands of visitors, who waited long hours and bore every inconvenience of crowding and of weather to see them. On many occasions the crowd was enormous, but it was always good-natured, and the simultaneous expressions of surprise, admiration, and delight that came from thousands of voices when the fountains were suddenly lighted up was an amusing and impressive feature of the scene.

GENERAL REMARKS.

One of the results of the Exposition is that the relations between France and all nations which exhibited are made closer and more friendly through it.

The French were wise enough to give timely notice to all

the French as the greatest people of modern times as organizers, producers, and artists, and the French will reap enormous benefits as the first civilized people who developed themselves to these nations.

The perfection of the administration of the Exposition, the magnificent show of industrial and agricultural products, the exhibits of the fine arts, which have never been equaled, the splendid works of engineering and agriculture which are shown in all parts of the grounds, the intelligent exhibits of the history of work, the colonial exhibits, in fact, everything connected with the Exposition, convinces an intelligent observer that the nation which could thoroughly organize so grand a work must at least be abreast of all modern nations in works of industry and art, and in the ability to organize and utilize the brains and muscles of its people.

Whatever may have been the reputation of France before the Exposition in these respects, it must be acknowledged that no other nation in the world could at this time have equaled France in its exposition of modern fine arts or could have exceeded it in any other department of the Exposition; and it is certain that no such great result, due to ability of administration and energy of purpose and to the enormous wealth of objects—the results of industry and art—has ever been attained by any other nation or can be surpassed in the near future. The fact that the Exposition was held in Paris was one great cause of its brilliant success. Within three miles of the Champ de Mars three millions of people lived. Although the cab or fiacre system was imperfect, it was perhaps as good as it would have been anywhere else, and it was well supplemented by the steamboats on the Seine, and by street-railways and omnibuses, regular and improvised. The most painful spectacle in all Paris, however, was the unchecked brutality and recklessness of cab and fiacre drivers, and the sufferings of the fiacre horses. Much of the pleasure of driving in the streets of Paris was destroyed by the constant sight of this cruelty and by the insolence of the drivers.

The main entrance of the Exposition was on the Quai d'Orsay, near the Ministry of Foreign Affairs, not more than ten

minutes' walk from the Place de la Concorde. The principal feeders were, however, the entrances from the Place du Trocadéro and on the Avenue Rapp. There were, however, wickets for entrances well distributed, so that in general there was not much crowding at them. The places for exit were not so numerous, and late at night, at the close, they were very crowded, and there was great difficulty tn getting away on account of the scarcity of cabs.

Another result of the Exposition was a great increase of prosperity from the enormous amount of money brought into France, and more especially into Paris, by its means. The figures are given in another part of this report. Nearly the whole working population of Paris reaped some moneyed benefit from the large expenditure, and thousands of the inhabitants, who would have been in misery through the whole season, were in comparative comfort in consequence of it.

It is not the province of this report to give an opinion as to the effect of this state of things on the election of September 22 for deputies; but it cannot be improper to state that in no city was there ever a quieter or more orderly election than it was, whether the improved condition of the voters had or had not any effect on their conduct at the polls.

One result of this Exposition, which, however, has been common to all international expositions is that the nations

approximation continue in international expositions that are to follow, the people of the various exhibiting nations must be forced to think more nearly alike, and will, therefore, be brought nearer each other. Such a result must conduce to the benefit of the human race, and will be one of the most important due to such expositions.

Another of the results of the Exposition of 1889 will be the more general use of iron hereafter in architecture, not only as ornament, but as a building material nearly as necessary and important as stone or brick.

All of the beautiful outlines of the buildings in the Champ de Mars were due to iron construction. The principal supports of the buildings were iron. The frames of the domes were iron. The filling between the forms was, in general, a cheap brick or stucco material, and the covers of the domes were encaustic tile. The roofs were generally of glass in iron frames. For constructions for an exposition, this cheapness is doubtless necessary, but the glass roofs were always a source of trouble from leakage.

Architects are agreed that iron is not a proper material for artistic constructive work in important buildings, but, in spite of the principles of art, it is coming more generally into use, and the example of the buildings on the Champ de Mars will have influence in extending the style of buildings there employed.

Terra cotta and plaster of Paris were used for the carved work and statuary of the buildings generally, and, as all of it was done with great artistic skill, the effect was very fine.

The shortness of the time for collecting the exhibit of the United States and delivering it in Paris was a source of embarrassment in many ways.

Our acceptance of the invitation to participate in the Exposition was only delivered in July, 1888, less than ten months before the date of the opening of the Exposition. We were the last large industrial nation which applied for an assignment of space, so that our choice was necessarily the last. It is probable that the spaces so assigned in Machinery Hall and in the Industrial Section were large enough for our exhibits, but

their location would have been in more prominent places had we been among the first to apply. The location of our exhibit in Group II was very bad, being off the ordinary lines of communication, and on an upper floor, so that this very creditable exhibit was somewhat neglected by visitors, although well appreciated by the juries. Other foreign exhibits in the same group—inferior to ours—had prominent positions, and we could doubtless have had one of these, if we had been earlier in the field.

Our Agricultural Exhibit, which was inferior to none in the Exposition, was more than a mile from the United States exhibits of machinery and industrial products, and nearly the whole distance was taken up with agricultural exhibits of France and other nations, crowded with visitors, rendering access to it a long and tedious work to any one whose object was to view all of the United States exhibits in one visit to the Exposition. As all of the agricultural exhibits were thrown upon the Quai d'Orsay—outside of the Champ de Mars—it is doubtful whether, on account of the enormous size of the exhibits, any better arrangement could have been made. Still, the very mention of the distance gives an idea of the magnitude of the Exposition. But if all the United States exhibits could have been placed together, the display would have been finer, and

and some of them very costly. The name of the country to which the building belonged was displayed on the façade. As many of these republics were exhibiting for the first time in an international exposition, they thus had the means of making their exhibits known and noticeable. In the case of the United States, its exhibit was too large and too varied to be placed in a special building, and besides it had been known as an exhibitor in every international exposition, so that no advertisement was necessary, and the appropriation would not have justified the necessary expenditure; neither could a proper site for the erection of such a building have been obtained at the late date of the acceptance of the invitation to participate in the Exposition.

The law authorizing the acceptance of the invitation to the Exposition was defective in the omission to authorize or require the various departments, bureaus, and museums of the General Government to send exhibits, with one exception—the Department of Agriculture. When application was made to the officials in charge for the loan of exhibits, the answer given was in nearly all cases that the property of the United States could not be allowed to go out of their control without the special authority of law. To this there was no answer. There were a few exceptions, but in general there was no moneyed responsibility involved. An attempt was made to get a law passed giving the necessary authority, but it was not successful. The general interest in the United States Exhibit would have been greater, and its appearance much improved, if the departments and museums had exhibited. Although our space was filled, the governmental exhibits would have taken the place of some small and insignificant exhibits which were not creditable to the United States. Besides, when the invitation was accepted, it ought to have been with the understanding that everything that the Government could do, in the time and with the means available, should be done to add to the value and interest of the exhibits.

Another defect was, the amount of the pay of jurors was left to the discretion of the Commissioner-General. Jurors ought to play a more important part in international exposi-

tions than they have hitherto. If they do their duty, they get perfect information on the classes to which they are assigned, and should be able to make valuable reports. In the Exposition of 1889, sixty jurors were allowed the United States. Some came from the United States purposely to serve on juries; others were travelers who consented to stay awhile at Paris for the same purpose; others were Frenchmen or citizens of the United States resident in Paris; and the remainder were the commissioners expert, and other officials of the Commission. The pay of those who came from the United States to serve should be enough to cover all expenses of travel and living abroad for six weeks at least, with a reasonable per diem allowance in addition. Those who stop at the place of the Exposition to sit as jurors should have their expenses paid while at the place, as should those who reside at the place of the Exposition. Those detailed from experts and other officials should not be paid. All should be required to make reports to the commissioners expert, and should receive a small compensation for them. But in any event, the amounts should be fixed by the law, and should not be contingent upon the amounts available from the appropriation for the cost of the Exposition after that cost is paid.

UNITED STATES AWARDS TO EXHIBITORS.

for pride in this result. It is to be feared that there will be a good deal of delay in the distribution of the diplomas, as the delivery of the plate, which was to have been finished by January 1, was postponed until March 1, and an official statement has been made that the diplomas will not, in consequence, be ready until August 31. The date has been since postponed to November 15, 1890.

FINANCES.

It has already been stated that the whole cost of the Exposition was not to exceed $8,600,000, of which amount the state contributed $2,400,000, the city of Paris $1,600,000, and the remainder, $3,600,000, was to be furnished by a guaranty association, which was to receive as payment whatever amount accrued from the sale of tickets at 1 franc (20 cents) each. This arrangement prohibited all gratuitous admissions, and would have embarrassed the management. As late as March 20, 1889, a new contract was made with an association of banks and bankers, which relieved the guaranty association, and undertook to furnish, besides the $3,600,000, an additional amount of $700,000. To reimburse this association, it was authorized to issue bonds to the value of $6,000,000, each bond promising to pay $5, and having attached to it twenty-five ticket coupons, detachable at will, and each good for one entrance to the Exposition. Each bond was also a lottery ticket. There are to be eighty-one drawings of the lottery, six of which took place during the Exposition. The remainder are distributed over a period of seventy-five years, when $5 are to be paid to the holder of each bond on presentation, without reference to what may have been drawn in the lottery. This arrangement was a success, and the bonds sold easily, so that the whole amount available for the Exposition was increased to $9,300,000. This increase was a great boon to the Exposition authorities, as it enabled them, without drawing upon the amounts set aside for the whole cost of the Exposition, to meet the payment of $360,000 guaranteed to the Society of Electricians for lighting the Exposition at night. This society consisted of French and foreign electrical light companies which were exhibitors. They were to be paid the

receipts of the evenings at the entrances, but they were in any event guaranteed the sum of $360,000.

A sum estimated at $60,000 or $80,000 was also set aside from the increased amount available, for the cost of the medals and diplomas of awards to exhibitors. The state and the city of Paris each contributed nearly $200,000 to the various fêtes, balls at the Palace of Industry, fêtes of the opening of the Exposition, the distribution of awards, etc. Sums were also appropriated for the cost of the dinners, receptions, and fêtes of all kinds given by the President of the Republic and the ministers, as accompaniments of the Exposition. If to the appropriations indicated above be added the cost of the exhibitions of the history of labor, which must have been nearly $1,000,000, and that of the colonial exhibits, all of which it is understood were undertaken by the state, and that of the exhibition by the city of Paris, it is estimated that the whole cost of the Exposition must have amounted to about $12,000,000.

To offset this large amount, the state and the city of Paris both received large accessions of revenue due to the Exposition. Thus the increase in revenue receipts for the first nine months of 1889 over the corresponding period of 1888 (not including the duties or taxes on sugar and salt) was $5,000,000. Of this amount $2,701,000 was from customs (salt and sugar not included), and $2,202,000 from the taxes on matches, to-

ceremonies of the opening of the Exposition, formal distribution of awards, receptions of foreign sovereigns, etc. The city also spent large sums for street improvements, repairs of ways, etc.

It is estimated that the amount saved from the computed cost of the Exposition, which was considerable, added to the amounts realized from the concessions to restaurants, theaters, and other places of amusement within the Exposition grounds, and to the sum realized from the sale of old material, lumber, etc., will be about $1,600,000. Of this amount, about $1,100,000 goes back to the state, and the remainder, about $500,000, to the city. To recapitulate:

The state contributed in the first instance	$3,400,000
Afterwards it contributed for fêtes, etc	200,000
And for personal fêtes, receptions, etc., say	200,000
Whole amount contributed by the state	3,800,000
The state received from increase of customs, taxes, etc., due to the Exposition	5,000,000
From amount realized from saving on first cost, concessions, etc., in Exposition, and sale of old material	1,100,000
Whole amount realized by the state	6,100,000
The city contributed in the first instance	1,600,000
For fêtes, etc., for the city generally	200,000
Improvements of streets, repairs of ways, etc	100,000
For entertainments and fêtes at Hôtel de Ville, say	100,000
Whole amount contributed by the city	2,000,000
The city received from increase of octroi	1,800,000
Proportion of amount realized from saving on first cost, concessions, etc., in Exposition, and sale of old materials	500,000
Whole amount realized by the city of Paris	2,300,000

For the twenty-six weeks from May 7 to November 4, 1889, the receipts of the six great railroads which do the main passenger traffic to and from Paris, viz., the Lyons, Northern, Western, Orleans, Eastern, and Southern, exceeded the receipts for the same period in 1888 by $11,941,329, and it must be admitted that more than $9,000,000 of that sum should be credited to the result of the Exposition.

There were more than 60,000 exhibitors; and it is estimated that each spent in round numbers $600 on his exhibit. This makes the enormous sum of $36,000,000 to be added to the cost of the Exposition, but nearly all of this sum was spent in France.

It is a difficult matter to determine the number of visitors who came to Paris in the summer of 1889 who were brought there merely by the Exposition. Several estimates have been made by independent statisticians which produce nearly the same result. They give as the increase of the permanent population of Paris, during the whole one hundred and eighty days of the Exposition, 200,000 persons, and their average daily necessary expenses, five or six dollars. Taking the latter figure, the amount of money which these persons spent, merely for board and lodging and cab hire, was the enormous sum of $216,000,000. If to this be added the cost of amusements, operas, theaters, etc., meals at restaurants, excursions in the vicinity of Paris, small and large purchases of every kind which were made by every visitor who came to Paris at this time, the estimate increases the figures above given one-half, making the enormous sum of $324,000,000 as the amount spent in Paris by visitors on account of the Exposition. The figures given are those of Mr. Berger, the Director-General of Management, Mr. Eiffel, and the London Engineering.

Before the Exposition was decreed, an estimate of the prob-

The balance-sheet of the Exposition, as given in the Official Bulletin of the Universal Exposition, November 23, 1889, is the following:

Amount realized from the association of banks and bankers	$4,300,000
Concessions and various receipts, including the amount received from 11,609 tickets issued by the state	400,000
Sale of old materials (estimated)	200,000
Amount appropriated by the state and the city of Paris	5,000,000
Total amount received	9,900,000
The estimated cost of the Exposition was	8,600,000
The actual cost as nearly as could be ascertained at the date given above was	8,300,000
Hence the excess of receipts ($9,900,000) over expenditures ($8,300,000) is	$1,600,000

It is officially announced that this result will be increased by the official figures.

In 1878 the receipts from the Exposition were	$4,737,040
The expenses of the Exposition were	11,078,000
Excess of expenditures over receipts	6,340,960
In the Exposition of 1867 the receipts were	5,428,920
The expenses were	4,596,764
Excess of receipts over expenses was	832,156

The French estimate of the number of people from the United States that visited Paris during the Exposition is 90,000.

DECORATIONS.

At the verbal request of Mr. Berger, Director-General of Management, I gave him a list of exhibitors and persons officially connected with the United States Commission, who were in my opinion worthy to receive decorations, from the French Government from the excellence of their exhibits, from their high positions in industrial and educational pursuits or in the arts, and from faithful work at the Exposition. The list was in general closely followed, but there were a few additions and omissions.

The number and kinds of the decorations are as follows, and a list of the names is appended to this report (Appendix II).

The grades of the decorations were assigned by the French authorities without any action by me:

Legion of Honor:	
Grand Officer	1
Commander (promotion)	1
Officer	5
Chevalier	22
Merit in Agriculture:	
Officer	1
Chevalier	4
Officers of the Order of Public Instruction	12
Officers of the Academy	6

Two of the decorations, viz., that of promotion to Commander of Legion of Honor and an appointment of Chevalier of the Legion of Honor, were delivered to the appointees before the formal presentation of recompenses, but both were counted as having been conferred on account of the Exposition.

The French authorities have been very generous in this matter, and the number of decorations presented to the United States citizens at the Exposition exceeds that presented to the citizens of any other foreign nation. This fact shows not only kindly feeling towards the United States, but is an evidence of the high appreciation of the French Government of the exhibit of the United States and of the persons connected with it.

detachment arrived at Paris shortly before the opening of the Exposition and stayed until its close. I have already reported the efficiency, good conduct, and soldierly bearing of the detachment in its duties, and my opinion of its value as a part of the United States Commission at the Exposition.

I desire now to thank the honorable Secretary through you for the good feeling towards the Exposition which prompted his cordial consent to the request for the detail. I believe that when the interests of the service will permit, the presence of a detachment of as good troops as are the United States Marines will always add dignity to a United States Commission at a foreign exposition, and will give the exhibit a more distinctive national character than it could attain by any other means.

FRENCH EXPOSITION AUTHORITIES.

The relations between the French administration and the officials of the United States Commission were most cordial. Overwhelmed with business as the French Exposition officers were, they could always be seen on official business, and always complied with reasonable requests. There was some friction with the financial department at first, due to changes and delays in the issues of free tickets to exhibitors' assistants. This was, however, soon settled, and is hardly worth mentioning except for the fact that the exhibitors considered that the delay was always due to the shortcomings of the United States Commission, and no explanation was satisfactory to them.

An attempt was made by the Exposition authorities to require the opening and operating of the United States Exhibit on Sundays. It was not pushed, however, after proper representations from the Commission were made.

The nomination for a vice-president of a group, made by the Commissioner-General, was withdrawn on representation made by the proper authority.

The business of the United States Commission was almost exclusively with Mr. Berger, Deputy Director-General of Management, and Mr. Marc Millas, consul of France, in charge of the foreign sections. My feeling towards them and their as-

sistants is extreme gratitude for their courtesy and kind attentions during the whole course of the Exposition.

The United States Commission and the exhibitors received their full share of invitations to fêtes and other official entertainments; still, there were never enough for all who thought it their right to have them, and many persons were disappointed. One of the most unpleasant duties of the Commissioner-General was to listen to the importunities of people to get invitations when all that were due to the Commission had already been distributed.

ASSISTANTS.

I was well assisted by my subordinates in conducting the business of the Commission. As a rule, persons connected with a United States Commission to a foreign exposition have no experience in international expositions, and the business is entirely new to them and requires a certain apprenticeship. By the time the business is learned, the exposition is over, and the employés scatter, usually declaring that they will never belong in any capacity to another exposition. The United States Commission was no exception to this rule. The business was new to all connected with it, except two or three persons, but it went on as well as that of the other foreign commissions,

dustry were untiring throughout the whole of his work. His business was to allot space to the exhibitors, to see that they complied with the regulations of the French authorities and those of the Commission, to settle all engineering problems in the distribution of power, and to be the channel of communication between the French directors of works and management and the United States Commission. The task was a delicate and difficult one, and could not be performed without friction, but he completed it with much skill and faithfulness. After the close of the Exposition he superintended the return shipments successfully, and the goods have arrived at their destinations.

Mr. A. Bailly-Blanchard, secretary of the Commission, served in this capacity from the early part of July, 1888, to the present time. He had entire charge of the correspondence between the French authorities and the Commission until April 15, 1889, and during that interval he displayed great skill in his treatment of various questions that came up on the subjects of space granted, steam power, use of engines constructed in the United States to drive its own exhibit of machines, and a multitude of other questions which constantly sprang up unexpectedly and required to be treated with diplomatic skill. During the Exposition, he also served as a member of one of the juries. In his whole service with the Commission he has shown the greatest industry, ability, and faithfulness.

Capt. D. A. Lyle, Ordnance Corps, U. S. Army, was detailed as a military commissioner to the Exposition, and my personal aide-de-camp. He also served as the vice-president of the jury of Class 74, vice-president of the jury of Group VIII, and member of the Superior Jury of Revision. He is also to prepare an article on the Military Exhibit at the Exposition. His behavior on the Commission, in the various duties to which he has been assigned, has been entirely satisfactory to me and justifies the high reputation that he bears in the army.

Lieut. B. H. Buckingham, U. S. Navy, was also detailed as military attaché to the Exposition, and was appointed my personal aide-de-camp. He made the contracts for ornamenting and fitting up the space allotted to the United States, and did

all other financial business that was required before the opening of the Exposition, to my entire satisfaction. He was, to my great regret, detached from this service to act as secretary of the Samoan Commission at Berlin, and only returned towards the close of the Exposition.

Dr. John A. Tonner, of Paris, very kindly volunteered his services to the Commission during the Exposition, and his attention and valuable professional skill were frequently given to members of the staff, the Marine Corps, and others, for which my best thanks are due.

Mr. W. Irving Adams, financial clerk, performed his duties with great skill and industry, and acted as cashier of the Commission from the beginning of the business in New York. The daily disbursements were made in two currencies, and the vouchers were presented in French and English, making some complication, but no difficulty has arisen in consequence.

The superintendents of divisions, Messrs. Thieriot, C. Wellman Parks, Aytoun, Pickering, Bickford, Hering, and Kunz, were efficient in the discharge of their duties, and Professor Parks did excellent work in the collection of the exhibit in Group II.

Prof. B. Abdank, the assistant engineer, had charge of the fitting up of the Electrical Exhibit, assisted by Mr. Hering.

COURTESIES RENDERED.

Mr. A. Caubert, citizen of France, magistrate, connected with the Exposition in its preliminary work, was noted for his constant kindness and attention to the members of the Commission. He was untiring in his official and unofficial efforts to make their residence in Paris pleasant during the whole duration of the Exposition.

I have already mentioned the kindness of Hon. R. M. McLane, minister of the United States to France. He took the trouble to bring me into friendly relations with the French Government authorities as well as those of the Exposition. His successor, Hon. Whitelaw Reid, was always courteous and kind, and ready to do anything in his power to help the business of the Commission.

Mr. Vignaud, first secretary of legation, did the Commission many favors, as did Col. Rathbone, consul-general of the United States. Lieut. Aaron Ward, U. S. Navy, naval attaché to the United States legation, served ably as a class juror.

My thanks are hereby extended to all of these gentlemen.

REPORTS.

There has been some delay in the receipts of the reports of the nine scientific expert assistant commissioners. They will all, however, be received soon, and the delay will not affect the date of publication of the reports, if the publication be authorized now.

Respectfully submitted.

W. B. FRANKLIN,
Commissioner-General.

Hon. JAMES G. BLAINE,
Secretary of State.

MEASURES AND VALUES.

In the present system of French measures, the metre is the unit of length and is equal to the ten-millionth part of a quadrant of a meridian of the earth; its multiples and divisions are decimal.

1 metre=10 decimetres=100 centimetres=1,000 millimetres.
1 metre=1.094 yard=3.28 feet=39.37 inches.
1 kilometre=10 hectometres=100 decametres=1,000 metres=0.621 mile.
1 mile=5,280 feet=1,610 metres=1.61 kilometre.
1 square metre=10.764 square feet=1.196 square yard.
1 are=100 square metres=119.6 square yards=1,076.4 square feet.
1 hectare=100 ares=10,000 square metres=2.47 acres.
1 acre=43,560 square feet=4,047 square metres=0.4047 hectare.
1 cubic metre=1 stère=35.32 cubic feet=1.308 cubic yard.
1 litre=1 cubic decimetre=1.057 quart=61.027 cubic inches.
1 hectolitre=10 decalitres=100 litres=26.42 gallons.
1 kilogramme=weight of one litre, or one cubic decimetre, of water=1,000 grammes=2.2046 pounds avoirdupois.
1 gramme=10 decigrammes=100 centigrammes=1,000 milligrammes.
1 gramme=weight of one cubic centimetre of water=15.433 grains Troy=0.0353 ounce avoirdupois.
1 franc=3 grammes of silver at a standard of nine-tenths fineness.
1 franc=100 centimes=$0.193.

REPORT OF THE ENGINEER OF THE UNITED STATES COMMISSION.

NEW YORK, *May* 31, 1890.

SIR: I submit herewith, for the illustration and explanation of your report on the Paris Exposition of 1889, as follows:

First. List of plates for Volume I.

Second. List of measures and values used in the reports of the United States Commission.

Third. Statement of the areas covered by the principal buildings erected by the French administration on the Champ de Mars and the Quai d'Orsay, as follows:

Building.	Square feet.	Acres.
Machinery Hall	654,550	15.00
Railroad Section	131,412	3.02
Industrial Courts	1,179,068	27.07
Palace of Liberal Arts	202,826	4.65
Palace of Fine Arts	202,826	4.65
Galleries Rapp and Desaix	77,224	1.80
Agricultural Buildings on the Quai d'Orsay:		
French Department	172,051	3.95
Foreign Departments	103,086	2.36
Total	2,723,043	62.50

Fourth. Statement of the spaces occupied by the United States in the different departments of the Exposition, as follows:

	Department.	Square feet.
A	Fine Arts, upper floor	7,800
B	Liberal Arts, upper floor	6,000
C	Industrial Courts, ground floor	37,000
D	Machinery Hall:	
	Ground floor 34,900	40,225
	Gallery 5,325	
E	Railway Section, ground floor	3,250
F	Agricultural Galleries	17,350
G	W. A. Wood, Agricultural Machines	1,075
	Total	113,300

The letters refer to the points indicated on the general plan.

While it is not my province to write a description of the grounds, buildings, and other features of the Exposition, it may be useful to furnish certain data as to the extent and dimensions of the principal buildings erected by the French administration, sufficient to afford, with the aid of the accompanying drawings, a correct general idea of the disposition of space occupied by the exhibits, especially those of the United States, within those buildings.

The principal structures located in the Champ de Mars were all connected in some way, and together formed three sides of a vast rectangle, almost touching the limits of this grand Paris parade ground on the three sides, and covering nearly one-half of its entire area.

Referring to the general plan of the Exposition, it will be seen that near the southeast end of the Champ de Mars, opposite the École Militaire, was located the Grand Machinery Hall or Palace, the greatest engineering exhibit of the Exposition, a wonderful structure covering 15 acres (over 650,000 square feet) of ground, and extending nearly the entire length of that end of the Champ de Mars which borders on the Avenue de la Motte Piquet. The plan of this building is rectangular, the length being 1,378 feet, the width 475 feet. The height to the apex of the bold arched roof is 148 feet. The general form of the building, with its roof and galleries, is shown on the transverse section and perspective herewith. By referring to these it will be seen that the central portion forms one great nave, 377 feet wide between the bases of the roof frames, the widest space ever covered by a single span of roof, and that the width of the building is further extended on either side of the nave by galleries 49 feet wide, having upper floors about 26 feet above the level of the ground. These upper galleries or balconies are continuous

The location of the United States Exhibit in the Machinery Hall and Railroad Section is indicated on the general map, and plans are given showing the spaces allotted to the exhibitors, the numbers in the blocks referring to the general catalogue.

The Machinery Hall, the adjoining railroad extension, the thirty-meter passage, and the Galerie Rapp, were kept open until 11 p. m., and were brilliantly lighted in the evening by electric lamps.

A stairway surmounted by a dome, with vestibule beneath, connected Machinery Hall with the handsome passage called by the French the Thirty-Meter Gallery. The interior of this gallery presented a remarkable vista of objects of rare merit, selected for this position as the finest exhibits of the most eminent French exhibitors, this being the place of honor of the French Industrial Groups. This fine passage, an interior view of which is shown, extended to the grand Dome Central, the most admired architectural feature of the Exposition, which fronted on the garden of the Champ de Mars. The Central Dome was regarded as the *entrée d'honneur*, the principal point of the Exposition, and it was within its artistically decorated interior that the President of the French Republic made his address on the occasion of the inaugural ceremonies, on the 6th day of May, 1889. A view of the exterior of this magnificent structure is shown, and it is also to be seen above the fountains in the frontispiece of this volume.

On the right and left of the thirty-meter passage was located a series of galleries or courts, constructed of rows of wrought-iron columns 26 feet high, surmounted by glazed iron roofs 36 feet high at apex, the width of the galleries between the lines of columns being 82 feet. These galleries contained principally the French exhibits in the Industrial Groups III, IV, and V. A view is shown of the interior of one of these galleries occupied by the French exhibits in Classes 28 and 29.

Adjoining these galleries and extending near and parallel with the Avenue de Suffren on one side of the Champ de Mars, and the Avenue de la Bourdonnais on the other, were other series of galleries of similar construction, which were occupied by the industrial exhibits of the visiting nations. The United States Industrial Section was located in the central court of the series near the Avenue de Suffren. It was 82 feet wide, 443 feet long, and extended from the Vestibule des Nations to the Galerie Desaix. Passages 16 feet wide ran longitudinally and transversely through the center of it, and narrower walks paralled with these subdivided the space and furnished suitable approaches to all exhibits.

A view of the façade of the United States Industrial Section is given. This was considered the principal point of the United States Section, and it was at this entrance that President Carnot was received by the Commission, on the occasion of his official visit to

our section. Views of the interior of the United States Industrial Section are also shown, and a plan giving the location of the spaces occupied by the exhibitors.

Next to the Industrial Courts came the two-story galleries, Desaix and Rapp, abutting on the Avenue de Suffren and the Avenue de la Bourdonnais respectively. These formed the dividing line between the Industrial Groups and the Palaces of Liberal Arts on the one side and of Fine Arts on the other. The United States Section in the Exposition of Liberal Arts, Group II, was located principally on the upper floor of the Galerie Desaix; one of the plates shows a small part of the United States Exhibit and a general view of the Galerie Desaix. No better or more extensive view could be obtained of the United States Section, the light from the windows rendering it impossible to get a proper photograph. A plan is given of the United States Section in Group II.

Adjoining the Galeries Desaix and Rapp, and near and parallel with Avenue de Suffren and Avenue de la Bourdonnais respectively, were located the Palaces of Liberal Arts and of Fine Arts, each of which was 754 feet long by 269 feet wide, and covered a ground area of over 200,000 square feet. The main center parts of the buildings were 175 feet wide with extensions of 49 feet on each side, these extensions having upper floors 23 feet above the ground floor. In the Palace of Liberal Arts a balcony at the height of the upper floor projected into the nave, and was connected by bridges to the upper floor of the installations in the central part of that building. This projecting balcony did not exist in the Palace of Fine Arts.

Illustrations of these buildings are given as follows: A perspective of the interior of the Palace of Liberal Arts, and an exterior view of

tables for the accommodation of the hungry crowds in pleasant weather.

The principal fronts of all these buildings were located on the inclosed garden of the Champ de Mars, and the principal ornamentation and architectural effect were given to the parts of the buildings seen from the garden. Those portions of the Champ de Mars and Trocadéro not covered by buildings and walks were tastefully ornamented with trees, shrubbery, parterres of flowers, cascades, and beautiful fountains, and the best artistic talent had been employed to make the interior views of the Exposition attractive and fascinating. At night the gardens and exteriors of the principal buildings were brilliantly lighted by lines, festoons, and other ornamental forms composed of electric lamps and gas jets, and the beautiful luminous fountains with their ever-changing colors completed a radiant spectacle of marvelous beauty.

Throughout the grounds were numerous special buildings, characteristic in design and ornamental in appearance, which were erected by various commissions and exhibitors.

It is not possible to speak of this great Exposition without mentioning the colossal "tower of three hundred meters" (984 feet), as it is termed on the French plans, generally called the Eiffel Tower, from the name of its constructor; the reader is therefore informed that a full description, with many illustrations, of this great engineering work is embodied in the report of the expert commissioner of Group VI, in one of the subsequent volumes.

Two views of the garden of the Champ de Mars and the buildings bordering on it are shown, one giving the luminous fountains and the central dome beyond, the other being a panorama from a photograph taken on the first landing of the Eiffel Tower.

In the panorama of the garden of the Champ de Mars are seen at a glance all the principal buildings of the Exposition. On the right and left, in the immediate foreground, are the Palaces of Liberal Arts and Fine Arts respectively. These are nearly identical in every particular, and are located symmetrically with regard to each other. The centers of both buildings are surmounted with domes nearly two hundred feet high, glazed at the top, and covered externally over down with enameled tiles in various harmonious colors and designs. The ends of Galeries Desaix and Rapp next appear, projecting beyond these palaces, about the center of the garden, and farther along come into view the Industrial Courts, stretching away to the grand roof of the Machinery Hall in the middle distance. In the center of the garden is the monumental fountain, representing France steering the Ship of Progress, and beyond this the principal entrance of the Exposition, crowned by the magnificent central dome, supporting a colossal statue of France distributing laurels. On either

side of the center of the garden are seen parallel lines of walks, covered by light frames roofed with colored canvas, to protect the public from the weather. Similar transverse covered walks connected with these and led to the Galeries Desaix and Rapp.

The United States had no exhibit on the Trocadéro, which was devoted principally to the Horticultural Exhibition, and which has not been essentially changed since the Exposition of 1878.

The Agricultural Galleries were located on the Quai d'Orsay. The space allotted to the United States in these galleries is shown on the plans. An interior view of the United States Section gives also an idea of the construction of these galleries. They were formed of rows of wrought-iron columns about forty-eight feet apart covered with iron roof-frames glazed. The sides of the galleries nearest the street and river were bricked up to a height of about ten or twelve feet above the floor, and were glazed from that level to the eaves of the roof. The opposite sides of the galleries were left without solid construction by the French administration, to be closed only by canvas curtains. The United States Commission, however, inclosed its section by solid wood and glass partitions on the sides originally left open.

Upon the Esplanade des Invalides were located various agricultural exhibits, including the Special Pavilion of Walter A. Wood; also the exhibits of the French War Department, of the French Colonies, of Hygiene, of Social Economy, etc.

A branch of the railroad which makes a circuit of Paris and connects with all the railway lines entering the city terminated near the western corner of the Champ de Mars. From the station, shown on the plans, tracks of standard gauge were laid into the grounds and

by the United States exhibits. The Decauville Company furnished, however, a portable railway of smaller gauge, an improvement on the system introduced by Peteler in the United States more than twenty years ago, which was found very useful and convenient in transferring freight between the United States departments, in connection with the standard gauge railroad, and for moving cases within the sections. For this reason and because the Decauville railway system was one of the features of the Exposition, it may not be inappropriate to give a brief description of it here. One of the plates contains four cuts, illustrating parts of the system.

The Decauville improvement in the track consists in permanently framing together light steel rails with flat steel cross-pieces or sleepers, thus composing a series of portable sections or bays having the appearance of ladders, and varying in length from four to sixteen feet, one length of sixteen feet weighing about one hundred and twelve pounds. With very little labor the sections of track are put down anywhere on the ground or floor, and they can be taken up and relaid in any desired direction. Each rail has at one end a base-plate and at the other end two fish-plates, and the junction of two contiguous sections is made in a moment by simply fitting the ends of the rails of one bay between the fish-plates on the ends of the next one. If the track is only to be used temporarily, no other fastening of the bays is required, but the fish-plates at the end of the rails are drilled, and corresponding holes are made in the rails at the other ends, so that the sections of track can be readily bolted together if the track is intended to remain in place and to carry locomotives, passenger-cars, or heavy freight-trucks. Curves framed in the same manner are supplied in lengths from four to eight feet with different radii from six to ninety-eight feet. Turn-tables, movable switches, crossings, etc., are also provided, all being formed in sections that can be carried and put down by one man. By these means either a temporary track can be quickly made ready for use, or a complete railway line may be established and equipped for permanent service. Various styles of trucks are provided, from the little wagons of thin iron, which were found so handy for delivering small cases in the sections, to strong heavy trucks with three or four axles, constructed for special uses. By combining two or more of these trucks on the same track or on parallel tracks great weights can be readily distributed and large objects easily handled. The 23½-inch gauge Decauville Railway has been adopted by the French Government for the transportation of ordnance weighing 16 tons upon two trucks with three axles, and even 18 tons upon four trucks with four axles. For moving long objects, like timber or heavy ordnance, swiveling-forks are placed on the trucks, by means of which curves as sharp as 18 feet radius can be rounded. The Decauville system has been much used for mining and agricultural pur-

poses. A type of locomotive was employed on the railway line of the Exposition which was specially designed by Mr. Mallet, to be used for military transportation purposes on Decauville railroads.

The organization of the United States Commission having been made in New York, and the preliminary work performed there under your personal supervision, it only devolves upon me to give a brief account of the operations at Paris from the commencement of the preparation of our sections until the end of the Exposition, and of the subsequent return of the exhibits to the United States, and the closing up of the business of the Commission in Europe.

Upon my arrival at the Exposition on the 11th day of March, 1889, I found the flooring already laid in our section in the Industrial Courts, and the partitions erected that separated the United States from the adjoining countries in the same groups. Nearly all the constructions and decorations required to put the Industrial and Educational Sections into a presentable condition for the installation of exhibits, had already been ordered by Lieut. B. H. Buckingham, U. S. Navy, and the contractor was progressing with the work, under the instructions of that accomplished and experienced officer. These constructions and decorations consisted chiefly of an ornamental façade fronting on the Vestibule des Nations, and designed to be the principal entrance of our department; the partitions separating the United States sections from the neighboring countries; the flooring in some of the sections; the hanging of *vélums* or tinted muslin shades, and of ornamental cords and pendants under the roof lights, and of painted canvas in various places on partitions and walls; the painting and general embellishment, including that of the constructive features of the buildings.

ing was laid in the passages only by the French administration; that in the space occupied by the exhibits being furnished by the United States Commission, except in cases of special floors put in by exhibitors.

Asphalt floors were put down by the Commission in the Agricultural Galleries.

Wooden partitions were erected in the Industrial, the Educational, and the Agricultural Sections on the lines dividing our spaces from those of the adjoining countries. These partitions were constructed according to the requirements of the French regulations, and the expense was shared equally by the commissions whose spaces they limited.

At the time of my arrival the first lots of goods shipped from the United States had reached the Exposition, and the following lots continued to arrive promptly. Some trouble and delay were caused by the delivery of cases where they did not belong. The railroad company loaded cars at Havre to suit their own convenience, without assorting the exhibits for the several groups, and many cases were on this account sent to the Machinery Hall that should have gone to the Industrial and other sections, and *vice versa*. These cases were transferred to their proper places later, mostly by the Decauville Company, who furnished the Commission with the necessary labor and with their portable railway, which, employed in connection with the established railroad tracks, proved to be a useful device for this purpose, and also for moving cases from place to place within the sections.

The space allotted to the United States in the Machinery Hall being inadequate to meet the demands of all persons who had made application to exhibit products belonging to the sixth group, while the space granted in the Industrial Sections was greater than was required, as a measure of relief permission had been obtained from the French administration to locate some of the machinery exhibits in these last-named sections. A considerable portion of the electrical apparatus was therefore assigned to the Industrial Court, as were also apparatus and appliances for civil engineering, including building hardware, mechanics' tools, etc.; also the carriage-work and some other classes.

Plans for the allotment of space in the different sections had been made in New York previous to my departure, placing the various kinds of products together, in accordance with the system of the French classification. Great difficulty had been experienced in providing places for all applicants. Formal permits for space had been given by the Commission, which had been as formally accepted by the applicants, and according to the best information then at the disposal of the Commission, the United States sections were likely to be filled to overflowing. A few days after my arrival at

Paris, however, notices of the withdrawal of applications commenced to arrive, and they continued to pour in from time to time by cable and mail until the opening day. The dereliction of many important applicants in failing to occupy the spaces allotted to them in New York caused continual changes of the plans, and entirely defeated all efforts at placing the products acccording to the proper classification. Many of the spaces allotted were never filled at all. Especially did much of the machinery promised fail to arrive, and great voids were thus left in Machinery Hall, giving our exhibit a meager appearance in comparison with the crowded sections of all other countries, and causing unfavorable comments in consequence. These vacancies might have been creditably filled if the Commission had known of it in time to obtain the products of other manufacturers. Many late applicants, to whom space could not be awarded originally, would have been glad to send their products, to the great advantage of our display, if they had not been kept away by those who had obtained space and then failed to occupy it.

As exhibitors and their agents arrived and took possession of the special places assigned them and commenced or completed their installations, it was often impossible to move them to other parts of the sections, and the most of those who were present were unwilling to change the location of their exhibits in order to accommodate others, or to keep together the products belonging to the same classes. Some of the exhibitors and their goods arrived late in Paris. There were instances in which it was supposed that they would not be present at all; and as the time of the opening approached, persons who were present were allowed to move their exhibits into positions originally intended for others who had not arrived, in order that the

they would not be inclined to engage more space than they actually need, nor would they be likely to pay for any space unless they really intended to occupy it. Money received for space thus disposed of could be properly and advantageously used for the decoration of the sections or for proper installations for the exhibits themselves, and by this means also a more suitable disposition of the installations could be effected.

In comparison with the symmetrical arrangement and elegant installations of the French departments our sections suffered greatly. The United States Commission had very little money to use even for the necessary constructions and the general decorations in its sections, and no funds at all to apply to the installation and proper adornment of the individual exhibits. To the decision of each exhibitor therefore had to be left, under certain restrictions, the arrangement, installation, and adornment of his particular space, which necessarily affected the general aspect of the section. The little time at our disposal rendered it impossible to obtain any concert of action between the exhibitors, and we had no power to compel them to construct their installations in any particular style or manner. Some exhibitors seemed rather inclined to have their exhibits as unlike as possible to those of their neighbors, in order perhaps to make them more conspicuous. In this way exhibits widely dissimilar in size and appearance were located in close proximity to each other. Many of the exhibitors, indeed, expended considerable sums on fine show-cases and other installations for their products; but even where several of these were located together, the styles of their cases and other constructions were so dissimilar that the general appearance of the section gained little from the best of them.

The resulting fortuitous assemblage of incongruous objects, located in an extensive gallery devoid of interior architectural features and of ornamental installations arranged according to a matured plan, produced anything but an imposing general effect. It can be easily understood how those who judge by the impressions received from the first view of an exhibition, without looking beneath the surface for the merits of the products, may have formed an erroneous estimate of the importance of the United States Exhibit. Let me remark here, however, that the juries, disregarding the surroundings and devoting their attention solely to the products exhibited, did them ample justice, and proved by the number and importance of the recompenses awarded that the United States Exhibit was second to none in this unequaled Exposition.

In the French divisions much time and money had been spent and great pains had been taken to render all their constructions, installations, and decorations appropriate in character and harmonious and captivating in appearance. Committees composed of officers of the French administration conjointly with the exhibitors themselves

had been engaged for months, if not for years, on the preliminary work. Architects had been employed for each class, and had given protracted study to the designing of the interior constructions in combination with the installations for the exhibits; and the art of the best decorators, cabinet-makers, and upholsterers had been called into requisition to perfect the charming displays and to produce the admirable general effects found everywhere in these groups. All of the show-cases and other particular installations were required to be subservient to the general design, and many of them were as attractive as the exhibits they were created to display. The fees of the architects and the cost of the entire work were paid by the exhibitors in proportion to the amount of space occupied. Views of the interior of one of the French Industrial Courts and of the Thirty-Meter Gallery are given to illustrate the above remarks and to show the construction of the buildings. The interior of the court is from a photograph taken after the close of the Exposition, when the hangings and exhibits had been removed and the railroad tracks uncovered; but even in this dismantled condition, it retained its elegant appearance.

Part of the exhibit of the Yale and Towne Manufacturing Company consisted of a model post-office, which was erected in the Industrial Section and was used by the Commission for the posting and distribution of mail matter for the exhibitors and persons connected with the United States department. This model post-office was completely equipped with letter-windows, letter-drops, lock-boxes, etc., and was of great service and convenience to the Commission and the exhibitors. It attracted general attention and was highly praised by visitors.

proper exhibit for the class; but the time was then very short, and manufacturers of such materials were generally unwilling to send over goods. Some few things were obtained, and an earnest appeal was made to certain companies to send exhibits. We were obliged to fill up the space with various material and appliances, made for the use of railroads, which actually belonged to other classes; such as railroad paints, which belonged as paints in Class 45; electric motors used on railroads, which belonged as electrical apparatus in Class 62; and some road-making and repairing machines, which, although used on railroads, belonged properly in Class 63.

The Pennsylvania Railroad Company alone responded to the call of the Commission, and sent a collection of its materials and constructions, which, with the Porter locomotive and the Wickes refrigerator car, saved the railroad department from actual ridicule. Part of the exhibit of the Pennsylvania Railroad Company consisted of sections of cars, which showed the constructions better than the entire cars, took up much less space, and cost less to make and send. This entire exhibit was presented at the close of the Exposition to the French School of Arts and Manufactures and a French railway company; none of it came back to the United States. The appearance of the railroad section was the occasion of much comment among the American visitors and others, believing, as they did, that the United States is pre-eminent in this class, and gave rise, among other witticisms to the remark that the section looked like the scene of a "railroad accident." This referred probably to the parts of cars, trucks, etc., shown, but never was anything less of an accident. On the contrary, the fine exhibit of the Pennsylvania Company was prepared by them, at the request of the Commission, with the patriotic design of making a display of parts of their apparatus, and the jury in this class, composed of the most eminent railroad engineers in Europe, were able to recognize its merit, which they acknowledged by awarding it a grand prize, the highest recompense in their gift. In spite of all efforts, however, the space in this class was not filled until the month of September, near the close of the Exposition, when a late comer appeared with the tubular iron car and closed up the void. If any discredit existed for the incompleteness of the railroad exhibit, it should rest, not upon those who participated in it, but upon the wealthy railroad corporations and the manufacturers, who refused to come to the aid of the Commission in its efforts to make a proper showing of our progress in this department, and who declined to send their improved apparatus and appliances, because there was "no business in it."

As may be seen by reference to the general plan, the United States sections were widely separated. A table is given below, showing the distance between the various points occupied.

Approximate distances in feet between different points occupied by the United States, following the roads.

	A.	B.	C.	D.	E.	F.	G.	H.
A.	0							
B.	1,600	0						
C.	1,550	50	0					
D.	2,100	2,050	1,250	0				
E.	2,300	1,300	750	350	0			
F.	3,470	4,200	4,150	4,700	4,900	0		
G.	4,770	5,500	5,450	6,000	6,200	1,150	0	
H.	670	1,860	1,620	1,900	2,400	2,800	4,100	0

Between the United States sections in Machinery Hall and the Agricultural Galleries, by way of Decauville Railroad, about two and one-third miles.

The great distances between the sections made necessary an increase of force to superintend and guard them. The average force employed during the continuance of the Exposition was about as follows:

Five superintendents of sections, one each to the Palace of Liberal Arts, Industrial Courts, Machinery Hall, and Agricultural Galleries.

Assistant superintendents were also necessary in the Palaces of Liberal Arts and of Machines, and in the Agricultural departments.

Other assistants were necessary to go between these sections for various duties.

The force of guardians, who were also employed during the early hours to clean the sections, averaged about as follows:

and their services were especially valuable during the closing days in guarding property when most exposed while being packed up for removal. The presence of the Marines enabled the Commission to save the employment of one guardian in the railroad section and one in the Machinery Hall Gallery. Elsewhere the number of guardians could not be reduced, as all those employed were necessary to clean the sections in the morning and to keep them in order during the day. I do not consider it proper for me to do more than mention the marines in this way here. You will doubtless give them full credit in your report for the advantage that the Commission derived from their presence at Paris.

The exhibitors and their representatives commenced to arrive in the early part of April, and to unpack their goods and get them into position, and from this time until late into the month of May our sections were alive with busy workmen arranging exhibits in their installations. In many cases where exhibitors neither came to Paris nor employed agents, the packages were opened and the goods were put into place by the employés of the Commission. Except in the section of Liberal Arts, where the building itself was not completed, the most of the exhibitors to whom space had been allotted in New York had their exhibits in place by the opening day. Later comers who got space (some indeed came over with their goods without having secured space) were not ready until some time after.

Our steam-engines arrived and were on their foundations in ample time, but they were not used until the latter part of May, as the French administration had not run the steam-pipes into our section, and the steam supply could not be obtained. The Brown engine commenced running on the 23d of May, and the Straight Line engines two or three days later.

The boilers which supplied the steam used in the Machinery Hall were located around the edifice in separate buildings, erected by exhibitors and contractors for that purpose, as may be seen by reference to the plans.

Steam, water, and gas were gratuitously furnished by the French administration. The French authorities contracted with an English firm for the steam supply in our section in the Machinery Hall. The supply was uncertain, and the service of the steam was unsatisfactory. For a considerable time after the opening of the Exposition it was hardly to be depended on at all, and during the continuation of the Exposition the quantity of steam required was often not available, and dissatisfaction was expressed by some of our exhibitors on this account.

The main piping for the steam, cold water, and gas supply, and for the removal of the hot water from condensation, was laid by the French administration, in tunnels of masonry located under the passages.

All branch piping in our section was provided by the Commission or by the exhibitors. The Commission was also required to put in an exhaust-pipe for its engines, which had to be carried under the floor to the outside of Machinery Hall, and then above the roof of that building. This pipe was connected outside of the building with an iron tank for collecting the water of condensation, from which ran another pipe for carrying the water to the main hot-water pipe above referred to.

Four main lines of shafting, two on each side of the central passage, extended longitudinally throughout the entire length of the grand nave of Machinery Hall, and were supported by double iron columns secured upon solid masonry foundations. They were furnished and put up by the French authorities, and received their movement from the engines of exhibitors of various nationalities. Two of these shafts passed through the United States section.

Motive power was supplied to our section in the Machinery Hall by the following named American steam-engines exhibited:

One hundred horse-power engine of C. H. Brown & Co.

One hundred horse-power high-speed engine of the Straight Line Engine Company.

Thirty-five horse-power high-speed engine of the Straight Line Engine Company.

Seventy-five horse-power high-speed engine of Armington & Sims.

Six horse-power Baxter engine of the Colt Manufacturing Company.

The two main lines of shafting passing through the first and second bands of our space were each driven at a speed of one hundred and fifty revolutions per minute by the larger straight-line engine and the Brown engine, respectively. The small straight-line engine

American inventors in this class, and as the space allotted in the Machinery Hall was not adequate, a large part of the electrical apparatus was exhibited in the Industrial and Railroad sections. The dynamo machines were placed in the Machinery Hall, where motive power could be obtained. The electrical apparatus, properly so called, were placed in the Industrial Court. The electrical tram-ways were placed in the Railroad Section; motive power was carried to the Agricultural Section for the purpose of operating the machines of certain exhibitors. The Thomson-Houston Company established the transmission of the electric current from Machinery Hall to the Agricultural Galleries, a distance of about three-quarters of a mile. This current transmitted fifty horse-power in a satisfactory manner. Its operation, however, was delayed by difficulties in passing the overhead wires across the streets of Paris, but permission was finally obtained from the Ministry of Commerce and the Prefecture of the Seine, and the machines in the Agricultural Galleries were put into operation on the 15th day of July. Besides this electrical transmission, two others were established between the Machinery Hall and the Railroad Section; one of them operated the Sprague system of electric railway, the other that of Thomson-Houston. For this purpose cables of the Cobb Company were used. The Edison Company supplied the current for the Sprague motor. Within the Machinery Hall the Commission established, for the accommodation of exhibitors far removed from the main lines of shafting, a transmission of electric force from a generator of fifteen horse-power and six small motors, which operated three exhibits of sewing-machines and some other light machinery.

The Bell Telephone Company established a system of telephones from the central office in their space in the Industrial Court to the headquarters of the United States Commission, the post-office in the Industrial Section, and the office of the superintendents in the Palace of Liberal Arts and Machinery Hall. The apparatus for this system of telephones was furnished and put up by the Bell Telephone Company and by the Western Electric Company of Chicago. Some two and one-half miles of wire for the overhead lines was furnished by the Okonite Company. This telephone system was of great service to the Commission, and it was kept in operation during the hours when the Exposition was open by the assistants of the Bell Telephone Company without any expense to the Commission.

I am happy to be able to state that no very serious accidents occurred in any of the United States departments during the Exposition, the most important being the breaking of the fly-wheel of the Corliss eight-line engine, by which, fortunately, no one was hurt. As this caused considerable comment at the time and deprived us of the use of one of our motive machines during the last few weeks of the

Exposition, it may be proper to give a short account of it here. On the 9th of October, about half-past 5 p. m., while the large straight-line engine was driving one of the main shafts in our machinery section, its fly-wheel suddenly broke, and the fragments were thrown violently against one of the large cast-iron columns that supported the shafting. The column was broken by the force of the blow, but remained in place, and the damage to it was easily repaired by wrought-iron bands. This accident prevented the running of the machinery in the front band of the section and of the overhead electric traveling bridge for one or two days, but did no other damage. An investigation showed that the breakage of the fly-wheel was due to defects in the casting. It was not possible to repair the damage to the engine in time for it to resume work before the close of the Exposition, and the shafting in that part of the section subsequently received its movement from the motive machine in the adjoining English section. Professor Sweet, the inventor of this admirable high-speed engine, has taken means to prevent the recurrence of such breaks in fly-wheels in future by providing them with strong wrought-iron rims or tires. The machine was one of the finest of our exhibits and was awarded a gold medal.

Before quitting the machinery department I desire to make one suggestion for the consideration of commissions to future expositions. You will remember that in the very outset of our work upon this Exposition I informed you of the dissatisfaction of American exhibitors and visitors at the Paris Exposition of 1867, arising from the presence of the clumsy French motor, placed in the most conspicuous position, and used for supplying the power in the United States Section, while the fine engine exhibited by Mr. George H. Cor-

porary work of this kind, which is another good reason for contracting with companies giving permanent employment to such men as are needed.

One view is shown of the interior of our section in the Agricultural Machinery Gallery. With the exception of the remarks above made concerning the force employed and the electrical transmission in this department, I do not consider it necessary for me to say anything, as the entire agricultural section and exhibit will be fully reported upon by the expert commissioner on Group VIII.

The principal troubles in our sections arose from the dissatisfaction of some exhibitors' agents and a few unimportant exhibitors of cheap jewelry and gimcracks, who should never have been allowed space, and whom it seemed impossible to get rid of without causing scandal. These men were a chronic nuisance; they were clamorous for the best places in the section, and even endeavored in some cases to obstruct the main passages and vestibules in order to dispose of their wares. Sales of articles of any kind for delivery before the end of the Exposition were prohibited by the French regulations. All applicants were informed of this before space was allotted to them. In spite of this, however, some persons, mostly agents, endeavored to make sales and immediate deliveries of their goods, and brought down upon the Commission by such means the complaints of the French administration. These refractory parties were greatly dissatisfied at not being allowed to sell their goods in the sections, and continued to do so clandestinely when they were not observed by the guardians, and were loud in abuse of the Commission for interfering with their business. I cannot now remember that any exhibitor of importance expressed dissatisfaction at the treatment which he received from the Commission or its officers.

It may be advisable for future commissions to exact guaranties for the respectability and good conduct of all persons allowed to act as representatives of exhibitors, and also to require indorsements of some official sort of all applicants from distant points about whose reputation the commission is not informed.

I will make a final suggestion which may be of benefit to those charged with the preparation of future international expositions.

In making agreements for labor, materials, etc., with contractors, clauses should invariably be inserted stating the time when the work is to be delivered and completed, and naming a penalty to be imposed in case of failure to comply with the terms of the contract within the time specified. Contractors are apt on such occasions to undertake more work than they can perform, and there is nothing like a penalty clause for keeping them up to time. Delays in the completion of one part of the preparations will often seriously retard other operations.

Very few of the packages sent from the United States to the Exposition were lost: of these I will mention one case containing a wheel-testing machine, which is supposed to have been removed by mistake by the French authorities the night before the opening of the Exposition, according to an official regulation which had been fully announced beforehand, that they should remove all unpacked cases at that time; and one other case, a very small one, containing some light articles of wood carving, which is supposed to have been stolen from the section at the time the goods were being opened. I cannot recall at present any other cases that were lost.

It was originally intended to close the Exposition on the 31st of October, but the French administration decided later to continue it a few days longer, and it was finally closed on the 6th of November. On the morning of the 7th of November every one started to work with a will to remove property, and the Exposition was a scene of busy movement from that time until near the end of the year. Our exhibitors, or their agents, who were present, had little trouble in performing their part of the labor, which consisted in the repacking of their goods and the marking of their cases. Special labels were furnished by the Commission. In cases where exhibitors were not present or represented, their goods were repacked by the Commission for return to them. All the formalities concerning the return of freight and all the shipping business were attended to by the Commission.

The first goods for the Exposition were shipped from New York to Paris February 1, 1889, by the French Transatlantic Company. The last packages of goods left our section of the Exposition on the 24th day of December, 1889. Some small exhibits and parts of

carted from the sections to the river. They were taken by boats down the river Seine to Havre. From Havre they were transferred to Liverpool by steamers of the Cunard Company. They were shipped from Liverpool to New York by the steamers of the Inman line. The last package of goods returned by this company reached New York City on the 20th day of April, 1890. The delay in the arrival of this freight in the United States seems to have been due to two causes. First, the Cunard Company did not hurry forward the freight immediately on its arrival from Havre to Liverpool, probably giving preference to other freight of their own when their boats were crowded. Second, the dock strikes at Liverpool prevented the Inman Company from obtaining men for loading vessels, and created, as is well known, great delay and trouble in all shipping business at that place in the early part of this year.

Some additional expense was caused by the shipment of the goods that were returned by way of Liverpool. As these goods were removed from the Exposition on wagons, the French custom-house authorities required that each case containing dutiable articles should be bound by cords fastened with lead seals before leaving the grounds, and that the seals should be removed by their officers at Havre before the departure of the goods from France. This necessitated the employment of additional clerical and laboring force, and was the cause, at times, of some delay.

The customs officials were always obliging and ready to aid us, and we were especially indebted to Mr. Charles Mulot, Comptroller of that service, for much friendly advice and kind assistance.

The French police and detective forces assigned to the care of our sections were composed of intelligent and reliable men, selected for this special service. They performed their duties in the most careful, efficient, and polite manner, and our relations with the officers and "agents" were always cordial and harmonious.

The house occupied as headquarters of the United States Commission, at 27 Avenue de la Bourdonnais, Paris, from the month of October, 1888, was vacated on the 31st day of January, 1890, after most of the books, papers, records, etc., had been shipped to the United States.

My duties, especially before the opening of the Exposition, threw me into contact with many of the officers of the French administration, principally with the Director-General, Mr. Georges Berger; the Chief of the Foreign Sections, Mr. Marc Millas; the Engineers of the Mechanical and Electrical Service, Messrs. Vigreux and Bourdon; the Architects of Installation, Messrs. Sédille and Hermant, and others. From all these gentlemen I received prompt and cordial assistance in the settlement of all matters referred to them, and the most polite and courteous attention. All of their business was per-

formed in a precise and thorough manner, but I have never seen less desire manifested to annoy people with unnecessary formalities or ceremonious behavior.

After your departure at the close of the Exposition, my duties brought me more frequently into relation with the United States Minister, Hon. Whitelaw Reid, and the officers of the United States Legation. I am indebted to all of these gentlemen for many civilities, and for hearty co-operation in all matters referred to them. Thanks are due, also, to United States Consul-General Rathbone, for prompt and polite aid in the formalities attending the return of the goods to the United States.

As you are personally familiar with the operations of the Exposition from its commencement to its close, and are well acquainted with all persons employed under you in the performance of the work, it is not incumbent upon me to name here any of those who have assisted me in carrying on my part of the management. It only remains, therefore, for me to thank you for the uniform kindness and consideration with which you have treated my efforts to make a success of the American Department of the Paris Exposition of 1889.

Respectfully submitted.

WM. C. GUNNELL,
Chief Engineer U. S. Commission, Paris Exposition of 1889.

General W. B. FRANKLIN,
United States Commissioner-General.

REPORT OF THE SUPERINTENDENT OF LIBERAL ARTS.

TROY, N. Y., *March* 29, 1890.

SIR: In reporting to you upon the work done by me at the Paris Exposition of 1889, I will confine myself to a description of that which occupied my attention as Superintendent of Group 2. I will say, however, that from the time of my appointment as class juror until the time of meeting of the group jury, I devoted such time as my other duties would permit to committee work. Thus most of my mornings were devoted to a very interesting and instructive work, that opened up before me many surprises, and induced me to believe that we, as a nation, should now copy from Europe in elementary educational matters, just as France copied from us after studying the report made by its very able Commissioner Buisson, who made a very careful study of the American exhibits that were shown at the Philadelphia Exhibition of 1876.

The principal advance made by European countries seems to be in the matter of providing new and improved tools in educational institutions, just as we have done in our factories and mercantile establishments. There may be a demand for cheap material, but we also notice a demand for an economical form of everything that can aid or in any way benefit either teacher or pupils, and not only the demand exists, but also the authority and funds with which to purchase.

Great attention is being paid to the sanitary condition of the rooms and buildings, and to the form of furniture best suited to the needs of growing children. The schools are becoming supplied with museums and models at a rate that surprises us who live in a land of local governments. These museums and models are prepared at small cost per school, but they are so well arranged that they represent an incalculable value to teachers and pupils alike.

For the amount of money that three vessels like the *Texas* would cost, every school in the United States could be supplied with such museums, and it appears to me that no better use could be made of such a sum than this, which would place it in the way of serving millions of people.

In the jury there were many able educators who were well acquainted with our systems, and inclined to treat us in a friendly manner.

During the fall of 1888 I had become interested in the Exposition to be held in Paris the next summer, and gladly accepted the position of Superintendent of Group 2, which you kindly offered me December 27, 1888.

A circular letter, dated October 28, 1888, had already been sent by this Commission to the educational institutions, soliciting exhibits, and, unfortunately for the success of our work, the impression seemed to exist in the office of the Commission that the Commissioner of Education would assist us by issuing the next circular. January 15 I became aware of the impossibility of receiving such assistance on account of press of work in the bureau, and prepared two circular letters, which I submitted for approval January 17. After approval, these circular letters were numbered 8 and 9 and put in the printer's hands, but some unknown cause delayed their issuance until the 25th of January. Within the next few days No. 9 had been mailed to most of the important libraries, and No. 8 to most of the other educational institutions.

As I had been informed at the office that the last shipment must be ready for the steamer that sailed March 16, it will be seen that there was a very short time after receiving our circular before the exhibit must have been sent, and consequently many did nothing who would have been able and willing to send attractive exhibits if they could have had more time. Early in March I was informed that shipments would be made later than the 18th, but I considered the information too late to be of much value in soliciting exhibits, and made no material change in my plans. If this extra time could have been counted upon when circular letters Nos. 8 and 9 were issued, it would have been of very great value to us.

case. These exhibits were nearly all sent to me in Troy by mail, in franked packages, and were there prepared for shipment to Paris.

March 16, 1889, having prepared and shipped all exhibits received up to that time, I sailed from New York on *La Gascogne*, and landed in Havre on the morning of the 25th of that month. By the middle of that afternoon I had reported for duty at 27 Avenue de la Bourdonnais.

The design according to which the buildings allotted to my group had been constructed was probably at fault; for the finished buildings, not being satisfactory to the administration, had just been torn down, and were about to be replaced by more artistic work. I watched the work, and with ever-increasing anxiety, as it became more and more evident that the buildings would not be completed by the time of the opening of the Exposition, several times causing the French administration to be informed that we were ready to enter upon the work of installation, and advising that anything that might be done to hurry the work would be much appreciated.

The building was of rough stone masonry, plastered on the inside, and as the month of April was very wet, the walls could not progress very satisfactorily. They were plastered the last of April, and the 4th of May found the floor laid and roof boarded, but it was the middle of May before the roof was made fairly tight, and the last of May before the walls were thought dry enough to paint.

In future exhibitions I advise the use of double flooring wherever it becomes necessary for the United States to use gallery space over that occupied by another nation, as it may prevent unpleasantness due to the carelessness of exhibitors and attendants.

As our space was in a narrow gallery and up one flight, it did not receive the attention which was given to the ground floor galleries, and was left until the last to be finished.

As soon as the walls were painted, I proceeded to cover them with exhibits up to the four-meter limit, and when the jury met on the 12th of June, we were ready for them. Long before the main part of the space had been prepared for installation, a corner had been inclosed, and all the small exhibits unpacked and stored in the place, so that we had very little trouble, after the walls and benches were prepared, in putting up exhibits.

As may be seen by reference to the Engineer's plan, there were some five thousand square feet of floor space devoted to Group II and Class 19 of Group III. The way in which the space was allotted to the various classes is also shown.

In 1878, as I understand, about two thousand square feet of the very best ground floor space were devoted to the educational classes, while we were obliged to be as contented as possible with one thousand square feet of very poor space. But we were informed that the Exposition was primarily commercial, and that the earlier commer-

cial applicants for space would be considered before the school exhibits. It became necessary therefore to condense the educational work. The exhibits were piled up on shelves and in closets, so that only a small part could be seen at any one time.

We decided on the arrangement of partitions and shelves giving a maximum amount of wall and shelf space, and at the same time straight aisles, which I consider of much importance where many people are passing. The alcove plan is objectionable on that account, even when it is not essential that a maximum of exhibition space be secured.

By the plan adopted I obtained, for Classes 6, 7, and 8, 1800 square feet of wall space, 500 of bench room, and 500 of aisles, on the thousand square feet of floor devoted to them. We were crowded in every class of the group, with the possible exception of Class 10 (inks, pens, etc.), and could easily have used five times as much space.

We had no more room for a wall display of drawings than was absolutely necessary to show that in America there are detached movements in the same direction as those which are most prominent in Europe to-day. These are the introduction of drawing and tool work into the curricula as intellectual aids, and not for the purpose of teaching trades.

The work shown by schools of this kind, both superior and secondary, compared most favorably with that shown by similar schools in France, Switzerland, and other European countries. In the superior class were the Massachusetts Institute of Technology, the University of Illinois, the Alabama Polytechnic and the Rensselaer Polytechnic Institute; and in the secondary class were the Manual Training School of St. Louis, and the Philadelphia Manual Training

scientific associations. It also contained a considerable number of reports and circulars from universities and colleges.

The work shown by Johns Hopkins University was considered of first merit, as any one must consider it, if it is recalled that it consisted of optical gratings and spectrum photographs by Prof. Henry A. Rowland, and the publications of the university.

The Rensselaer Polytechnic Institute made a rather large and very interesting exhibit of works written by members of the faculty and alumni, and of photographs of works erected by alumni. This institution also claims some share in Professor Rowland's work, as he is an alumnus, and taught physics in the institute before he became a member of the faculty of Johns Hopkins University.

The exhibit made by the Massachusetts Institute of Technology was very complete and compact, as an exhibit from an engineering school should be.

Just at this point I would like to make a comparison of the number of awards given to the Educational Group in 1878, with the number given to these classes in 1889:

Class.	1878, 2000 square feet of floor space.				1889, 1000 square feet of floor space.				
	Gold medals.	Silver medals.	Bronze medals.	Honorable mention.	Grand prix.	Gold medals.	Silver medals.	Bronze medals.	Honorable mention.
Class 6	16	25	17	11	1	25	28	15	9
Class 7	7	13	3	12	1	8	6	3	3
Class 8	4	4	3	.....	9	5	11	3	18
Classes 6, 7, 8	.....	.....	.....	.....	.....	4	4	2	.....
Total	27	42	23	23	11	42	49	23	30
Grand total	115				155				

If we evaluate the awards according to the following scale—

Grand prix = 5
Gold medal = 4
Silver medal = 3
Bronze medal = 2
Honorable mention = 1

we find 2.63 for the average value of award in 1878, and 2.88 as the average value in 1889. This is the highest average value for any nation, France included.

Besides the educational exhibits, we had two other collections, one of books arranged by Mr. E. Turquem, and another of periodicals arranged principally by Mr. Albert F. Parks. These, together with a few individual exhibits, constituted Class 9. Mr. Turquem arranged the book collection in a very prominent place, just opposite the entrance from the main stairway, *and made* a very fine display of the

work of our principal publishing houses. The collection of trade, educational, and literary journals occupied an alcove between the Turquem collection and the space occupied by Portugal, and in front of the office of the superintendent of the section.

The larger individual exhibits of Classes 10 to 15 inclusive were arranged as shown on the plan. There were very few exhibitors in these classes, on account of our inability to give them as large spaces as they asked for.

In making application for space, nearly everybody asked for enough for desk-room and a broad aisle around the show-cases, disregarding the fact that the Commission had made proper arrangement for aisles, and expected the exhibitors to use the whole space granted for exhibition of objects. Another difficulty in arranging the plan of installation was the lack of information regarding the styles and sizes of exhibitors' show-cases. The heterogeneous collection of show-cases in the American section should be considered as the thing most responsible for any little dissatisfaction that may have been felt on account of the appearance of the section.

Class 16 occupied a small amount of floor space, and would have required about ten thousand square feet of wall space for as complete a display as was made by France in the same class. With us the exhibits were piled one above another, until everything had been placed upon the tables, where they could be examined by such interested people as were willing to handle hundreds of large maps and charts. Our window space was used for Class 19 of Group III, and contained an exceptionally fine window by John Lafarge, and similar work by other American artists and glass manufacturers.

So far as I know, every exhibit, at one time or another, was brought

So far as I have been able to find out, no nation has a higher average for its Group II, and we may say that we received more awards in Group II than any other foreign nation, and that our average award was higher than that of any nation, France included. I think, moreover, that the awards were secured at less cost to our Government than those in most other groups, and less even than the awards in the same group in 1878. At that time the separate expense account for the Educational Group covered Classes 6, 7, and 8, which occupied about two thousand square feet, while the group expenses in 1889 covered Classes 6 to 16 inclusive, and Class 19, which occupied five thousand square feet of floor space.

During the time of unpacking and placing exhibits I was aided by James B. Collins, who served as my assistant during the greater part of the Exposition period, and by Carl Ohlsen, who acted as chief guardian of the group. He was assisted by from one to three other guardians, as the circumstances seemed to require, and that they did their duty is shown by the facts that the section was well cleaned, and that the only things stolen during the daytime were eight small photographs. During the earlier months of the Exposition a private of the Marine Corps was stationed in the group to act as a guardian. During the night we left the section in the hands of the French guardians, and I believe that they did their duty, as only one claim of loss was made by an exhibitor. As this exhibitor had left his drawer unlocked, and as he had filed no invoice with the commission showing the goods claimed to have been stolen, I choose to believe that he made a mistake in counting, and that the property of American exhibitors was efficiently guarded both day and night.

During the summer more people passed through our group than I had expected, although there were few Americans among the visitors. The crowds very rarely began to come before noon, and not often before 2 o'clock, but the section was generally well filled from that time to the closing hour. The visitors were quiet and orderly, and many of them were quite appreciative, although the interested ones rarely came in the afternoon. I estimated the largest number that passed through in any one day at 12,000, while the smallest number in any one day was perhaps 200.

As the day for closing the Exposition approached, I began to arrange exhibits so that they could be easily and quickly packed, and had new boxes made to replace special ones that could not be found in the storage yards. Early on the morning of November 7 the cases for Group II were delivered at the most convenient door, and before noon all had been taken into the gallery and were being filled. November 7 and 8 I gave my personal attention to the distribution of exhibits that had been donated to various institutions, and also to the packing of cases. At sunset of the 8th, there were only

three cases of the collective exhibit to be packed, and agents had packed many of the individual exhibits. That evening I went to Havre, and sailed the next morning for New York on the steamer *La Gascogne.*

After having been in America for some time, I received the collective educational exhibit, which had been forwarded from Paris by way of Liverpool, and proceeded to distribute the parts to their respective owners, or to such places as had been designated. These packages were mostly sent by mail, but a few large ones were forwarded by the National Express Company.

After the close of the Exposition, I arranged a collection of reports, etc., to be used by the reporter of the jury for Class 6 in making his report, and gave explicit directions for forwarding the collection to him. By a letter recently received, it appears that the documents never reached him, so I collected another but smaller set, and sent them by registered mail the first of this month.

I believe I can now report that all of the exhibits of the educational collection are returned or accounted for.

Personally, I would thank you for your continual kindness, which made the past summer one of the pleasantest of my life.

Respectfully submitted.

C. WELLMAN PARKS,
Superintendent of Liberal Arts.

General W. B. FRANKLIN,
Commissioner-General.

STAFF OF THE COMMISSIONER-GENERAL.

UNITED STATES COMMISSION.

*Commissioner-General,**
WILLIAM B. FRANKLIN, Hartford, Conn.

*Assistant Commissioner-General,**
SOMERVILLE PINKNEY TUCK, New York City.

Lieut. BENJAMIN H. BUCKINGHAM, U. S. Navy, aide-de-camp, Naval Commissioner.
Capt. DAVID A. LYLE, Ordnance Department, U. S. Army, aide-de-camp, Military Commissioner.
Capt. HENRY CLAY COCHRANE, U. S. Marine Corps, Commanding Detachment of Marines.
Lieut. PAUL ST. CLAIR MURPHY, U. S. Marine Corps.

Scientific Experts appointed by the President as assistants to the Commissioner-General, corresponding to and assigned to the Nine Groups into which the Exposition is divided.

Group I	RUSH C. HAWKINS	New York City.
Group II	ARTHUR J. STACE	Notre Dame, Ind.
Group III	DAVID URQUHART, Jr	Helena, Mont.
Group IV	WILLIAM H. CHANDLER	Bethlehem, Pa.
Group V	SPENCER B. NEWBURY	Ithaca, N. Y.
Group VI	CHARLES B. RICHARDS	New Haven, Conn.
Group VII	A. HOWARD CLARK	Boston, Mass.
Group VIII	CHARLES V. RILEY	Washington, D. C.
Group IX	DAVID KING	Newport, R. I.

Chief Engineer	WILLIAM C. GUNNELL.
Secretary	A. BAILLY-BLANCHARD.
Medical Officer	JOHN A. TONNER, M. D.
Assistant Engineer	B. ABDANK.

*Appointed by the President and confirmed by the Senate.

SUPERINTENDENTS OF DIVISIONS.

Fine Arts	J. H. THIERIOT	Group I.
Liberal Arts	C. WELLMAN PARKS	Group II.
Industrial	J. FREDERIC AYTOUN	Groups III, IV, and V.
Machinery	T. R. PICKERING	Group VI.
Agriculture	F. T. BICKFORD	Groups VII, VIII, and IX.
Electricity	CARL HERING.	
Minerals	GEORGE F. KUNZ.	

FOREIGN COMMISSIONERS-GENERAL.

List of the Commissioners-General of the several countries participating in the Paris Exposition of 1889.

Country.	Name.	Title.
Argentine Republic	E. Olivera	President.
Austria-Hungary	Louis Burger	do.
Belgium	Victor Lynen	do.
Bolivia	Luis Salinas Vega	do.
Brazil	Viscount de Cavalcanti	Commissioner-General.
Cape of Good Hope	Viscount de Montmort	do.
Chili	Carlos Antunez	President.
China	Teng-Ting-Keng	Commissioner-General.
Colombo	General Posada	President.
Denmark	Carl Jacobsen	do.
Dominica	Baron de Almeda	do.
Ecquador	Clemente Ballen	Commissioner-General.
Egypt	Aly Pacha Chérif	President.
Finland	Hjalmar Londen	do.
Great Britain	Right Hon. James Whitehead	do.
Greece	Ernest Vlasto	Commissioner-General.
Guatemala	Crisanto Medina	do.
Hayti	Emil Simmonds	President.
Hawaii	Col. Z. S. Spaulding	Commissioner-General.
Honduras	Louis Gaubert	do.
Italy	M. T. Villa	President.
Japan	Kentaro Yanagiya	Commissioner-General.
Luxembourg	Tony Dutreux	Commissioner-Delegate.
Mexico	Manuel Diaz Mimiaga	Commissioner-General.
Monaco	Marquis of Maussabré-Beufvier	Executive Commissioner.
Morocco	Abdel-Kerime Bricha	Commissioner.
Netherlands	W. van der Vliet	Commissioner-General.
New Zealand	Sir Francis Dillon Bell	do.
Nicaragua	J. Francisco Medina	do.
Norway	Frederic Baetzmann	do.
Paraguay	Winsweiler	do.
Persia	General Nazare Aga	President.
Peru	Alejandro de Ydiaquez	Commissioner-General.
Portugal	Councillor Marianno Cyrillo de Carvalho.	President.
Roumania	Prince Georges Bibesco	Commissioner-General.
Russia	E. d'Andreeff	President.
San Marino	Pietro Tonnini	do.
San Salvador	Dr Antonio Quiroz	do.
Servia	Jefr. P. Goudovitch	do.
Spain	Matias Lopez y Lopez	do.

List of the Commissioners-General of the several countries participating in the Paris Exposition of 1889—Continued.

Country.	Name.	Title.
Siam	Krom Mun Nares Voravariddhi	President.
South Africa	T. N. de Villiers	Commissioner-General.
Switzerland	Dr. Numa Droz	President.
Tasmania	Mr. Braddon	General Agent.
United States of America	General W. B. Franklin	Commissioner-General.
Uruguay	Domingo Ordonana	President.
Val d'Andorre	Bonhoure	Commissioner-General.
Victoria	Hon. W. F. Walker	President.
Venezuela	General Guzman Blanco	do.

HONORARY COMMISSIONERS APPOINTED BY GOVERNORS OF STATES.

Paris Exposition, 1889. *Honorary Commissioners appointed by Governors of States.*

States.	Name.	Post-office address.
Alabama	W. S. Reese	Montgomery.
	Daniel Coleman	Huntsville.
	James S. O'Shaughnessy	do.
	Thomas M. Scruggs	Decatur.
	D. J. G. Thomas	Mobile.
	J. M. Cary	Union Springs.
California	Sidney M. Smith	San Francisco.
	David Cohn	do.
	W. H. De Young	do
	Joseph D. Redding	do.
	Max Wasserman	do.
	Max Hellman	do.
	J. E. Goux	Santa Barbara
	Charles M. Campbell	Sacramento.
	Eugene Germain	Los Angeles.
Delaware	S. C. Bird	Wilmington.
Florida	W. G. Chipley	Pensacola.
	A. B. Mason	Jacksonville.
	A. R. Duval	do.
	H. B. Plant	do.
	W. S. Webb	do.
	Mrs. M. S. Young	do.
	J. E. Ingraham	Sanford.
	A. N. Haldeman	Tallahassee.
	Mrs. Ellen C. Long	do.
	George W. Wilson	Osceola.
	J. L. Gaskins	Starke.
Illinois	Abram E. Smith	Rockford.
	Henry H. Spaulding	Chicago.
Iowa	A. Power	Davis County.
	W. W. Power	do.
	J. H. Boeyer	Cerro Gordo County.
	Floyd Davis	Polk County.
	Sylvain Block	Hardin County.
	S. W. Hurst	Decatur County.
	Thomas Griffith	Montgomery County.
	Dr. McKenzie N. Graves	Cass County.
	T. G. Steinke	do
	James Crosby	Clayton County.
	Frank Brignon	Powesheik County.

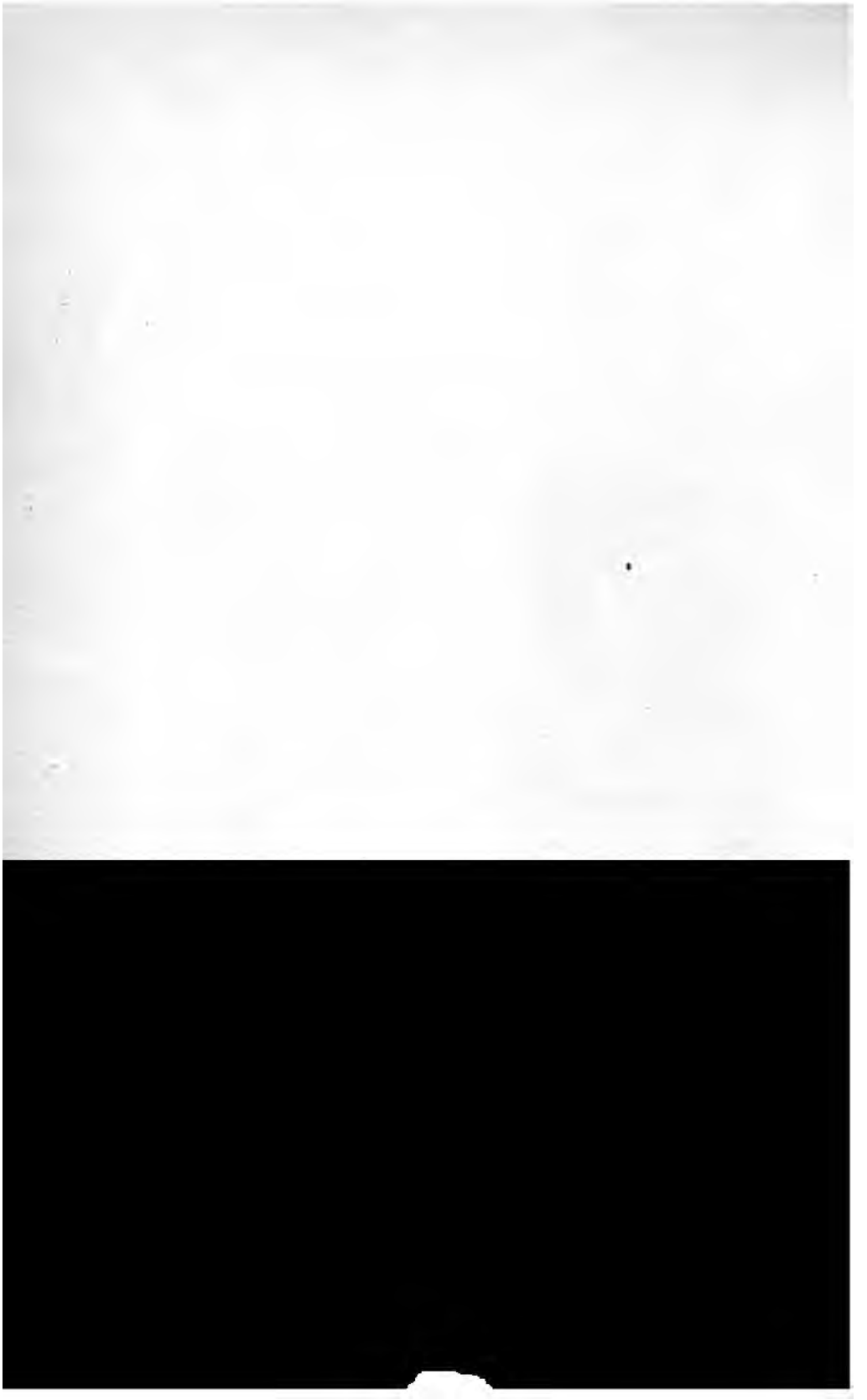
Paris Exposition, 1889. *Honorary Commissioners appointed by Governors of States*—Continued.

States.	Name.	Post office address.
Kansas	Emile Fermin	Florence.
Louisiana	Dr. E. de Nux	
	Philippe Marchet	
	James A. Vignaud	
	Jean Gentil	
	D. A. Chuffraise	
	Charles T. Soniat	
Maine	William Seligman	Paris.
	Edmund B. Mallett	Freeport.
	Gen. Neal Dow	Portland.
	John E. De Witt	do.
	G. O. Lapointe, M. D.	Biddeford.
	Rev. James Gorman	Brunswick.
	Emile Barbier	Augusta.
Maryland	Hyllyard C. Lee	
Michigan	Edward J. Smith	Detroit.
Mississippi	Alfonso Stadaker	Canton.
Missouri	Prof. S. Waterhouse	St. Louis.
	Jerome Hill	do.
	Lewis C. Nelson	do.
	John Boffinger	do.
	Andrew Warren	do.
	Dr. Augustus Gallagher	Kansas City.
	Col. Winslow Judson	St. Joseph.
	Victor Barth	Columbia.
Montana	D. W. Seligman	Helena.
Nebraska	J. N. H. Patrick	Omaha.
	R. W. Patrick	do.
	W. F. Cody	North Platte.
Nevada	F. M. Biber	Carson City.
	R. K. Colcord	

[redacted]

***Paris Exposition*, 1889.** *Honorary Commissioners appointed by Governors of States*—Continued.

States.	Name.	Post-office address.
Pennsylvania	James N. Jeitles	Philadelphia.
	John L. Lawson	do.
	Charles H. Brinley	
	Dr. M. J. Grier	
	Andrew Carnegie	Pittsburg.
	John Henry Harjes	Paris, France.
	John P. Zaner	Bradford.
Rhode Island	Aram J. Pothier	Woonsocket.
South Carolina	T. E. Horton	
Tennessee	J. W. Billings	Nashville.
	J. D. Goodpasture	do.
	J. T. Shipp	do.
	T. O. Morris	do.
	Dr. George H. Price	do.
	G. H. Stockell	
	Robert Scales	
	S. D. Claybrook	Franklin.
	M. J. Obrien	Nashville.
	W. K. Phillips	
	M. M. Bright	Fayetteville.
	B. F. Cook	Chattanooga.
Texas	Joseph Jacobs	
	A. Blum	
	B. C. Wells	
	Eugene Phillippi	
	L. B. Chilton	
	F. B. Chilton	
	T. H. Conklin	
	Isaac Stein	
	Ivy H. Burney	
	William S. Red	
	Rufus C. Burleson	
	Herman Knittell	
	S. B. Allen	
	G. H. Forcke	
	A. C. Hamilton	
	A. E. Valois	
	W. L. Bringhurst	
	J. G. Tucker	
	Alexander McFarlane	
Virginia	Thomas Nelson Page	Richmond.
	John Pope	do.
	Lewis Ginter	do.
	Henry Preston	Danville.
	Thomas J. Pinn	do



LIST OF THE SUPERIOR JURY.

SUPERIOR JURY—*Paris Exposition*, 1889.

Messrs.	P. Tirard.....	President of the Council.....	France.
	A. Fallières.....	Minister of Public Instruction and Fine Arts.	France.
	M. Tisseraud.....	Minister of Agriculture.....	France.
	Teisserenc de Bort	Senator.....	France.
	Dietz-Monnin....	Senator.....	France.
	Poirrier.....	Senator.....	France.
	Berthelot.....	Senator.....	France.
	Christophle	Deputy.....	France.
	Dautresme.....	Deputy.....	France.
	Louis Pasteur ...	M. D....	France.
	Léon Say.....	Senator.....	France.
	Jules Simon.....	Senator.....	France.
	Meissonier	President Group I.....	France.
	Rohmann	Vice-President Group I.....	Russia.
	Mélida	Vice-President Group I.....	Spain.
	Poubelle	President Group II.....	France.
	Somerville P. Tuck	Vice-President Group II.....	United States.
	Gobat.....	Vice-President Group II	Switzerland.
	David Perret....	President Group III	Switzerland.
	Darcel	Vice-President GroupIII	France.
	Cattaui	Vice-President Group III	Austria-Hungary.
Deputy	Méline	President Group IV	France.
Mr.	Joseph Leigh....	Vice-President Group IV	Great Britain.
Count	Zamoiski	Vice-President Group IV	Russia.
Deputy	Sabatier.....	President Group V	Belgium.
Senator	Scheurer-Kestner	Vice-President Group V.....	France.
Mr.	Ygarzabal	Vice-President Group V.....	ArgentineRepublic.
Messrs.	Picard	President Group VI	France.
	Frescot	Vice-President Group VI	Italy.
	Belpaire.....	Vice-President Group VI	Belgium.
	Thurston.....	Vice-President Group VI	United States.
Deputy	Prevet	President Group VII	France.
	Navarro-Reverter	Vice-President Group VII	Spain.
	Marianno C. de Carvalho	Vice-President Group VII	Portugal.
	Vercruysse-Bracq	Vice-President Group VII	Belgium.
Count	Foucher de Careil	President Group VIII.....	France.
Captain	D. A. Lyle.....	Vice-President Group VIII	United States.
Messrs.	Blaremberg	Vice-President Group VIII	Roumania.
	Ladislas Netto...	Vice-President Group VIII.....	Brazil.

Sir	Colville-Barclay .	President Group IX.....	Great Britain,
Messrs.	Freiwald	Vice-President Group IX.....	Netherlands.
	Hardy	Vice-President Group IX.....	France.
	Gréard		France.
	Lemoine		France.
Senator	Dauphinot		France.
Messrs.	Frémy		France.
	Alcorta	Commissioner-Delegate...	Argentine Republic
	Antunez	President Chilian Commission.....	Chili.
Prince	Georges Bibesco .	Commissioner-General	Roumania.
Count	A. de Camondo..	Executive-Commissioner	Italy.
Deputy	Jules Carlier.....	Commissioner-General	Belgium.
Viscount	de Cavalcanti....	Commissioner-General	Brazil.
Colonel	Juan Diaz.....	Commissioner-General	Uruguay.
Mr.	Mimiaga Diaz...	Commissioner-General.....	Mexico.
General	W. B. Franklin ..	Commissioner-General.....	United States.
Messrs.	Gibert	Commissioner-Delegate.....	Servia.
	Kentaro Yanagiya	Commissioner-General	Japan.
	Matias Lopez....	President Spanish Commission.....	Spain.
	Crisanto Medina.	Commissioner-General	Guatemala.
	Francisco Medina	Commissioner-General	Nicaragua.
Viscount	de Melicio.....	President Lisbon Commission.....	Portugal.
Messrs.	Pandia Ralli.....	Commissioner	Greece.
	Pector	Commissioner-General	Salvador.
	Posnansky	Commissioner-General	Russia.
	Van der Vliet....	Commissioner-General	Netherlands.
Colonel	Voegeli-Bodmer .	Commissioner-General	Switzerland.
Mr.	Wood	Commissioner-Delegate	Great Britain.
Deputy	Etiénne	Commissioner	French Colonies.
Messrs.	Henrique..... ..	Commissioner	French Colonies.
	Müller	Commissioner	Algeria.
	Sanson	Commissioner	Tunis.
	Alphand	Director General of Works.....	France.
	Berger	Director General of Management	France.

INTERNATIONAL JURY OF PRIZES—SUPERIOR JURY.

REPORT TO THE PRESIDENT OF THE COUNCIL, MINISTER OF COMMERCE, OF INDUSTRY AND OF THE COLONIES, COMMISSIONER-GENERAL.

Mr. PRESIDENT: In its first general session, held August 26, the Superior Jury on Prizes decided to confide to a sub-committee of twenty-five members, consisting principally of the presidents of the committees and group juries, the duty of examining certain disputed questions brought forward at that session, of making out the list of persons proposed for prizes which in its opinion should be ratified, and of examining the reclamations received. This sub-committee was composed as follows:

Mr. Teisserenc de Bort, President; Messrs. Dietz-Monnin and Poirrier, Vice Presidents. Members: Messrs. Alphand, Dauphinot, Foucher de Careil, Frémy, Gréard, Hardy Larroumet, Leigh, Lyle, Lemoine, Meissonier, Navarro-Reverter, Picard, Poubelle, Prevet, Léon Say, Sabatier, Sir Colville Barclay, Commander Frescot, and Colonel Perret. Secretaries: Messrs. Hetzel and Trélat.

Mr. Gréard substituted Mr. Somerville Pinkney Tuck in his place, and Mr. Foucher de Careil, Mr. Grandeau.

The Director-General of Management, assisted by Mr. Monthiers, Chief of Service of the French Sections, was present at all the sessions.

The sub-committee met fifteen times, and generally held two sessions a day. The importance and multiplicity of the work which it had to accomplish are shown by the fact that it required a bureau of numerous clerks, under the direction of Messrs. Monthiers and Hetzel, more than two days to open the proceedings and classify the decisions.

Exhibitors are inevitably led to believe that a Superior Jury possesses all the powers necessary to set itself up as a redresser of wrongs, and that it is therefore its mission to revise and verify, name by name, all the decisions of the class and group juries. The sub-committee did not so understand its mission. It adopted first, as a general principle, that it would modify only in very exceptional cases the decisions of the class juries ratified by the group juries. It decided, however, to take into consideration all the reclamations presented by the exhibitors, or in their names, though it well knew that

most of them would be only the cries and complaints of wounded vanity. In order to assure promptitude and regularity in its work, it sent to the representative of each group jury the reclamations affecting the exhibitors in the different classes of that group.

The next proceedings were the reading by the representatives of each group of the names proposed for the first-class prizes, such as diplomas of grand prizes and diplomas of gold medals, and after this the presentation of written reclamations. Once the discussion ended and the decisions taken, the commissioners-general of the different foreign countries were permitted to present all the observations which they wished to present on the part of their countrymen, and which it had been impossible to transmit in writing. This method was the only one under which the sub-committee could escape the reproach of partiality and neglect of the interests of some one or other.

A great number of the reclamations referred to the omission to examine certain articles, or to their examination by juries of a class in which they should not have been included. The sub-committee, whenever it found that these reclamations were well founded, delegated those of its members whom their special competency pointed out, to examine and pass upon such articles, assisted by certain members of the class and group juries, or foreign commissioners-general. The reports of these delegates led to the award of the supplementary prizes, which are mentioned on the memoranda annexed to this report, alongside of those definitely awarded, after certain changes decided on in consequence of reclamations recognized as well founded. It is proper to add that these changes, consisting in elevating or reducing the grade of the diplomas proposed

the honor of the eminent men who composed the sub-committee. If it had been possible to record the elevated ideas which were exchanged, to picture the important industrial, economical, and artistic questions, which were treated in the course of the discussion with most attractive fullness, the Exposition would have left behind it one document more to attest the value of the men who figured on its juries.

It would take long to extract from the record of the proceedings, drawn up with remarkable exactness, and a faithfulness that the complication of the discussions might have made impossible, even a résumé of the arguments and considerations on which were based the decisions in the matters submitted to the jury, and presented to it under aspects as different as unexpected, although belonging to similar questions.

It must suffice me to say that the sub-committee never intended to appear to substitute its opinion for that of the class and group juries, whose investigations it was bound to respect, made, as they were, with a competency which the sub-committee could not pretend wholly to possess. It enunciated no decisions: it simply passed upon the form and spirit in which the decisions had been made, whenever it was necessary. The testimony which it has had to record amply proves, besides, the care and equity which presided over the deliberations of the juries.

The sub-committee, taking as its text the words pronounced by you, Mr. President, in the opening session of the International Jury on Prizes, has desired to furnish to our foreign guests proof of the cordial hospitality of France, and of her gratitude to the nations who responded to her call. It was not sufficient for the sub-committee that these foreign nations were represented in its body by seven members; it gave free access to its deliberations to the representatives of the different national sections, whether they were members of the Superior Jury or not. All could be heard at its bar.

The Exposition of 1889 will make its mark in the history of the American nations. By their admirable aid in certain classes of Group II, especially, and by their incomparable exhibitions of raw material and natural products in Groups V and VII, the nations have affirmed, and the Superior Jury has confirmed, their irrefutable right to enter into the concert of the most powerful nations. The Old World must decidedly account with the progress of the New.

One of the novelties of the Exposition was the Section of Social Economy. Mr. Léon Say, amid the applause of the sub-committee, developed an interesting and moving report on this section, in which it has been found necessary to inform economists and heads of provident institutions over and over again how they could become exhibitors. It is now settled that there exists in the questions of social economy a new element of classification for future exposition.

In the course of their fifteen sessions the sub-committee examined about seven hundred and four questions, as follows:

First. Thirty-five questions submitted to its judgment relating, under different aspects, to the principle of non-competition; to the distinctions to be drawn between diplomas of prizes and commemorative diplomas referred to in Article 23 of the Regulations of the Jury; and to the classification to be made of the collaborators recommended for prizes.

Second. Six hundred and sixty-nine questions relating to exhibitors properly so called, and having for their object the elevation or the reduction of certain prizes; the award of diplomas to products overlooked or insufficiently examined; the confirmation of decisions made by class juries and amended by group juries, etc.

A certain number of these last questions were decided after the reports drawn up by the representatives of the groups, or furnished by the delegates nominated by the sub-commission, had been heard. These six hundred and sixty-nine reclamations are divided by group as follows:

Group I	9	Group VII	18
Group II	153	Group VIII	33
Group III	74	Group IX	1
Group IV	90	Social Economy	7
Group V	125		
Group VI	159	Total	669

Finally the presidents of the groups were authorized by the sub-committee, after having come to an understanding with the presidents and reporters of the class juries, or with the secretaries of the group juries, to decide directly upon ninety-one simple questions,

I have the honor to ask you to propose to the Superior Jury to accept this number. If it needs to be enlightened on the details of the operations of the sub-committee, the tables, drawn up class by class, and the reports of the proceedings are at its disposition. The members of the sub-committee are also ready to give all necessary explanations, each in what concerns him.

I need not add that the Commission decided, conformably to the sentiments which appeared to prevail in the first session of the Superior Jury, certain questions of principle submitted to it. Thus it maintained firmly the rules adopted on the subject of non-competitive exhibits, ratifying the decision of the juries to consider that when directors general, delegate managers, and presidents of the councils of administration of manufacturing associations or companies, act as members of the jury, they thereby put out of competition the exhibits of such associations and companies. It has admitted no exception to this rule, and has even declared out of competition an exhibit in Group III exhibited in the name of a firm which contained the name of an exhibitor in Group I. It refused, on the other hand, to admit that the directors of special departments of such associations and companies could, by their presence on the jury, involve the non-competition of these associations, companies, etc.

Thus, too, it concluded, conformably to the terms of my last report, that a producer exhibiting dissimilar articles in different classes might receive as many distinct prizes as there were dissimilar exhibits: but the same person could not claim two or more prizes for the same article examined by juries of different classes, even if these classes had nothing to do with each other.

The Commission also thought, contrary to the conclusions of the same report, that certain exhibitors of Group IX, having taken part in the temporary competitions in horticulture, might be considered as permanent exhibitors, and competent therefore to receive prizes of the character of those referred to in Article 7 of the Regulations of the Jury for the exhibitors in the groups of Fine Arts, of Industry, and of Agriculture. A special delegation will be added to the Jury of Group IX to decide upon such propositions as it may make for this purpose.

The last question brought before the sub-committee was that of the prizes of the collaborators. A very thorough discussion took place on this subject. Every one recognized, as I had said in my report, that the spirit of Article 16 of the Regulations had been badly or too liberally interpreted. Recognizing that it was impossible to make in season a complete and equitable revision of the work of the class juries, the sub-committee discussed the question whether it was necessary, in order to diminish the number of recommendations to the extent required by the administration, to proceed to the suppression of all the high prizes of the collaborators, as far as the

silver medal, for example. This plan might be defended upon the ground that the directors, chief engineers, and superior functionaries of the establishments awarded prizes had morally, from the nature of their positions, their share in the prize awarded. But this view was considered too subtile.

On the other hand, it would have been deplorable to attain the desired end by striking out a comparatively large number of prizes of the lower grades. Such a proceeding would have been anti-democratic, and would have deprived of their prizes those workmen and overseers whom the regulations had especially in view in speaking of collaborators.

The sub-committee decided, therefore, to propose that the number of collaborators prizes should be limited to 5,500, and that, no matter to whom they were awarded, they should consist in each case of a diploma only.

The sub-committee suggests to the Superior Jury to have the kindness to adopt this solution.

GEORGES BERGER.

REGULATIONS OF THE INTERNATIONAL JURY.

INTERNATIONAL JURY ON PRIZES.—REGULATIONS.

TITLE I.—*General Dispositions.*

ARTICLE 1. The appreciation of and the verdict on works of art, as well as on the industrial and agricultural products exhibited, are intrusted to an international jury comprised of titular and supplemental members, divided into the eighty-five classes of the general classification, as settled by the ministerial decrees of August 26, 1886, March 11 and May 1, 1887.

ART. 2. In each of the Class Juries the number of titular members for each nationality and for each branch of art or industry represented shall be, as far as possible, proportioned to the number of exhibitors and the importance of the exhibits.

The total number of titular members, however, French and foreign, of the International Jury on Prizes, shall not exceed nine hundred.

ART. 3. The total number of supplemental jurors, French and foreign, of the International Jury on Prizes, shall not exceed one-third of the titular members.

ART. 4. The French titular and supplemental members of the International Jury on Prizes shall be chosen from the great departments of the Government, the academies, the principal boards and incorporated bodies, and for the most part among persons who, as exhibitors or as jurors appointed by the French Government, have received important prizes at the Universal International Expositions of Paris, London, Vienna, Philadelphia, Sidney, Melbourne, Amsterdam, Antwerp, Barcelona, or Brussels.

ART. 5. Supplemental jurors shall have votes only when they occupy the places of absent titular jurors.

ART. 6. The French titular and supplemental members of the International Jury on Prizes shall be named by presidential decree, on the nomination of the President of the Council, etc. Commissioner-General for the Class Juries of Group II to IX, and of the Minister of Public Instruction, etc., for the Class Juries of Group I.

The foreign titular and supplemental members of the International Jury on Prizes shall be selected for each nationality by the foreign national committees.

All nominations must be made before May 5, 1889.

ART. 7. Each Class Jury of Groups II to IX can add to its members as associates one or more persons of competency on the subjects submitted to its examination. These associates or experts may be selected from among the titular or supplemental members of any class, or among specialists in the subject under consideration, outside of the members of the jury. The persons thus added shall not take part in the labors of the Class Jury to which they have been attached, except for the special object for which they were added, and they shall have only a consultation vote.

The choice of these associates or experts must be approved by the President of the Council, etc., Commissioner-General.

ART. 8. Exhibitors who have accepted the office of jurymen, whether as titu or supplemental members, shall, *ipso facto*, be disqualified to receive a prize.

Exhibitors attached as associates or experts shall also be disqualified, but only the class in which they may take part.

ART. 9. The prizes to be awarded under the form of diplomas placed at the dis sition of the International Jury, are divided as follows:

Grand Prizes,	Diplomas of Silver Medals,
Diplomas of Gold Medals,	Diplomas of Bronze Medals,

Diplomas of Honorable Mention.

ART. 10. The International Jury on Prizes must finish its labors between Ju 1 and September 1, 1889. But as regards the classes of Groups VII, VIII, and intended for temporary competitive exhibition, the labors of the jury may be c tinued during the whole of the Exposition, as is laid down in Title III of the R ulations in force.

ART. 11. The formal distribution of prizes shall take place in the course of t month of September.

ART. 12. A general report of the labors of the International Jury on Prizes a an official list of the names of the successful exhibitors shall be published.

ART. 13. In accordance with Article 3 of the Decree of July 28, 1886, it shall the duty of the Director General of Management, aided by his principal assistan to prepare and direct the labors of the International Jury on Prizes, to receive a forward the results of the labors of the said Jury, to assure himself that the exhi of no exhibitor has escaped examination, to listen to the observations and rec mations of exhibitors, and to see that the rules are observed.

The Director-General of Management shall have the right to be present at a meeting of the International Jury on Prizes, or to be represented, but he cannot i tervene in the deliberations, except to state facts, recall the regulations, and subm the reclamations of the exhibitors.

TITLE II.

Award of prizes.—Dispositions applicable only to the permanent exhibitions

Groups I to IX.

ART. 17. The presidents, vice-presidents, and reporters of the Class Juries shall compose the Group Juries, which shall meet July 20, 1889.

Each Group Jury shall name a president, two vice-presidents, and a secretary, who may be chosen outside of the members.

A decree will determine the number of Frenchmen and foreigners who may be called to these functions.

The nominations shall be made by decree on the suggestion of the President of the Council, etc., Commissioner-General, for Groups II to IX, and on that of the Minister of Public Instruction, etc., for Group I.

ART. 18. Each group shall revise and decide upon the classified lists submitted by the Class Juries.

It shall consult successively each Class Jury on the decisions which concern it, and agree upon the suggestions to be made to the Superior Jury as regards the number and division of prizes of each kind to be assigned to each class.

The results of the labors of the Group Juries must be transmitted to the Director-General of Management August 15, 1889; if the report of any group should not be ready on this date the Superior Jury shall supply it *ex officio*.

ART. 19. The Superior Jury shall have for honorary president the President of the Council, etc.; it shall have for honorary vice-presidents, the Minister of Public Instruction, etc., and the Minister of Agriculture.

It shall have for president and vice-presidents the president and vice-presidents of the Superior Commission of Revision, as constituted by the ministerial decrees of March 11 and May 4, 1887.

It shall be composed of—

The vice-presidents of the Commission of Control and of the Finances; the presidents and vice-presidents of the Group Juries; the members of the Superior Commission of Revision; the commissioners-general or the presidents of the National Commissions, whose country numbers more than five hundred exhibitors inscribed on the catalogue.

The president of the special jury of the Exhibition of Social Economy, instituted by Article 21; the Director-General of the Works; the Director-General of Management; the Director-General of Finances; the Chief of the Mechanical and Electrical Services; the Chief of Service of the French Section; the Chief of Cabinet of the Ministry of Commerce and of the General Administrator of the Exposition; the Director of Fine Arts; the Special Commissioner of Fine Arts, and the Director of Agriculture.

ART. 20. The following are named secretaries of the Superior Jury:

The secretaries of the directors-general of the Exposition; the chief of cabinet of the Minister of Public Instruction, etc.; the chief of cabinet of the Minister of Agriculture; the sub-chief of the General Administrator of the Exposition, and the secretaries of the group committees.

ART. 21. The Superior Jury shall meet August 20, 1889. It shall examine the recommendations of the Group Juries, and shall decide, without recourse and according to merit, on the lists of exhibitors in each class entitled to prizes and on the number and distribution of the prizes of the different kinds to be conferred on the successful exhibitors.

ART. 22. A special jury of thirty-two members shall be created for the Exhibition of Social Economy. The nominations shall be made by decree on the proposition of the President of the Council, etc., Commissioner-General.

One-half the members shall be chosen among the members of the sectional committees of the Exhibition of Social Economy; the other half shall be taken from outside.

The special jury of the Exhibition of Social Economy shall meet June 1, 1889. At its first meeting it shall elect its bureau, composed of a president, a vice-president, a reporter, and a secretary.

The special jury of the Exhibition of Social Economy shall prepare, in order of merit, the list of exhibitors who can receive prizes, and shall make its recommendations relative to the number and distribution of the prizes of the different kinds.

The results of the labors of the special jury on the Exhibition of Social Economy must be submitted to the Director-General of Management August 15, 1889, to be transmitted directly to the Superior Jury.

ART. 23. Special diplomas may be awarded to persons who have taken part in the Retrospective Exposition of Labor and of the Anthropological Sciences, and in the Retrospective Exposition of the Fine Arts, by loaning articles to members of the different committees, commissions, and juries, as well as to functionaries of the administrative services.

TITLE III.

Award of prizes—Special dispositions as regards the temporary competitive exhibitions of Groups VII, VIII, and IX.

ART. 24. During the whole duration of the Exposition the Class Juries interested shall submit to the President of the Council, etc., Commissioner-General, the names of the associates they may desire to add to their number for the examination of the products comprised in the temporary competitive exhibitions which may take place in certain classes of Groups VII, VIII, and IX.

The presentation of the names of these temporary associates shall be made eight days at least before the day fixed for the opening of each of such temporary competitive exhibitions.

As soon as these temporary competitive exhibitions shall be ended, each temporary committee, composed of members of the jury of the corresponding class and of their temporary associates, shall prepare, in order of merit, a list of the exhibitors, collaborators, and workmen whom it shall judge worthy of prizes, and shall arrange them in four lists under the titles of "first prizes," "second prizes," "third prizes," and "honorable mentions."

This classification may be published immediately.

ART. 26. As soon as the temporary competitive exhibitions shall have ended, the Group Juries of Groups VII, VIII, and IX shall prepare a list, by name, of the ex-

DISTRIBUTION OF INTERNATIONAL JURORS.

Distribution by country and by classes of the foreign members of the international jury of awards.

Countries.	Group I. Works of Art.					Group II. Education and Instruction: Apparatus and Processes used in the Liberal Arts.										
	1 and 2.	3.	4.	5.	5*bis*.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
France and Colonies	26	14	10	5	19	12	10	9	14	10	6	8	9	8	7	6
Netherlands	2	...	...	...	1	...	...	...	2	1	...	1	...	...	...	...
United States of America	4	1	...	1	...	1	1	...	1	1	...	1	1	...	1	1
Austria-Hungary	2	1	...	...	...	...	...	...	...	2	...	...	...	...	...	...
Sweden and Norway	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Belgium	4	1	1	1	1	1	...	1	1	...	1	...	1	1	1	...
Denmark	2	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Spain	2	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...
Great Britain and Colonies	4	1	2	...	...	...	...	...	...	...	...	1	1	...	2	...
Greece	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Italy	2	2	...	...	...	...	...	1	1	...	1	...	1	...	...	...
Finland	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Russia	1	1	...	...	...	...	...	...	1	...	...	...	1	...	1	...
Switzerland	1	...	...	...	...	1	...	1	1	...	...	1	1	1	2	1
Egypt	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Japan	...	...	...	...	1	1	...	...	...	1	...	...	...	...	...	...
Brazil	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...
Luxembourg	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Persia	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
International Section	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mexico	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1
Total	59	22	13	7	23	18	12	13	23	16	10	12	15	10	14	10

Countries.	Group III. Furniture and Accessories.												
	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.
France and Colonies	9	8	9	11	7	4	4	5	8	8	7	10	10
Netherlands	...	...	...	1	...	...	...	...	...	...	...	...	...
United States of America	1	1	1	1	...	1	...	1	...	...	1	1	1
Austria-Hungary	...	...	1	1	1	...	...	...	...	...	...	...	2
Belgium	2	1	1	1	1	...	...	...	1	...	1	...	1
Denmark	1	...	...	1	...	...	...	1	...	...	...	...	...
Spain	1	...	...	...	...	...	...	...	1	...	...	...	...
Great Britain and Colonies	1	...	1	2	...	1	...	...	...	1	...	...	...
Greece	...	...	...	...	1	...	...	...	...	...	...	...	...
Italy	1	1	1	1	...	...	...	...	1	...	...	...	...
Russia	1	...	...	...	...	...	1	1	...	...	...	...	1
Switzerland	...	1	...	...	...	...	...	1	...	4	...	...	1
Egypt	...	...	...	...	...	...	...	1	...	...	...	...	...
Japan	...	1	...	1	...	...	...	...	1	...	...	...	1
Brazil	1	...	...	...	...	...	...	...	...	...	...	...	...
Roumania	...	...	...	1	...	...	...	...	...	...	...	...	...
Servia	...	...	...	...	1	...	...	...	...	...	...	...	...
Portugal	...	...	...	1	...	...	...	...	...	...	...	...	...
Siam	...	...	...	1	...	...	...	...	...	...	...	...	...
Persia	...	...	...	1	...	...	...	...	...	...	...	...	...
Mexico	1	...	...	...	...	...	...	...	...	...	...	...	...
Siam	1	...	...	...	...	...	...	...	...	...	...	...	...
Total	20	13	14	24	11	6	5	10	12	13	9	11	17

Distribution by country and by classes of the foreign members of the international jury of awards—Continued.

Countries.	Group IV Textile Fabrics, Wearing Apparel and Accessories.											Group V. Extractive Arts, Raw and Manufactured Products.						
	30.	31.	32.	33.	34.	35.	36.	37.	38.	39.	40.	41.	42.	43.	44.	45.	46.	47.
France and Colonies	12	8	17	13	9	9	15	9	6	3	6	22	8	11	9	22	4	10
Netherlands	...	...	...	...	...	...	...	1	...	...	...	1	...	...	1	1	...	...
United States of America	1	...	...	...	...	1	1	1	1	1	...	1	1	...	1	1	1	1
Austria-Hungary	...	...	1	...	...	1	2	1	...	...	...	...	...	...	...	...	...	...
Sweden and Norway	...	...	...	...	...	...	...	1	...	...	...	1	1	1	...	2	...	...
Belgium	1	1	2	1	1	1	1	....	1	...	1	3	1	...	1	1	1	1
Denmark	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...
Spain	1	...	1	1	1	....	1	...	...	...	...	1	1	....	1	...	...	1
Great Britain and Colonies	2	2	1	1	...	....	1	1	1	...	...	3	...	...	2	2	...	...
Greece	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Italy	...	...	...	1	1	...	....	1	...	...	...	1	...	...	....	1	...	...
Finland	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...
Russia	1	....	1	1	...	1	1	...	...	...	...	2	...	1	1	1	...	1
Switzerland	...	...	...	2	2	1	1	....	...	...	...	1	...	...	...	1	...	1
Egypt	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Japan	...	...	...	1	...	...	...	...	...	...	...	...	...	1	1	...	...	...
Brazil	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1	1	...	1
Central and South America	...	...	2	....	1	....	2	...	...	...	...	8	9	4	10	3	...	3
Luxembourg	...	...	1	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...
Roumania	...	...	...	...	...	...	2	...	...	...	...	1	1	...	...	...	...	1
Servia	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Portugal	1	....	1	...	...	...	1	...	...	...	...	1	1	...	...	1	...	...
China	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Persia	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mexico	...	...	...	...	...	...	1	...	...	...	...	1	1	....	1	1	...	...
Total	19	11	27	26	15	14	29	15	9	4	7	53	26	20	30	38	6	20

Countries.	Group VI. Apparatus and Processes of Mechanical Industries. Electricity.																	
	48.	49.*	50.	51.	52.	53.	54.	55.	56.	57.	58.	59.	60.	61.	62.	63.	64.	65.	66.
France and Colonies	9	....	10	6	13	4	5	4	5	3	6	4	11	15	13	22	11	13	8
Netherlands	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...
United States of America	1	...	1	1	2	1	...	...	1	1	1	1	1	1	2	1	...	...	...
Sweden and Norway											1							1	

***Distribution by country and by classes of the foreign members of the international jury of awards*—Continued.**

Countries.	Group VII. Food Products.						Group VIII. Agriculture: Cultivation of the Vine. Fish Culture.						
	67.	68.	69.	70.	71.	72.	73.	73*bis*.	73*ter*.	49.	74.	75.	76.	77.
France and Colonies	10	5	8	5		13	46	5	6	11	18	8	6	6
Netherlands	1					2	3							
United States of America			1	1		1	1	1		1	1	1		
Austria-Hungary	3						2							
Sweden and Norway				2			1							
Belgium	1					1	3				1			
Denmark							1	1						
Spain	1		1			1	4							
Great Britain and Colonies	1						4			2				
Greece	1			1			1							
Italy							2							
Finland			1			1	1							
Russia	2					1	2							
Switzerland	2		1			1	2							
Egypt						1								
Japan	1						1							
Brazil	1					1	1							
Central South America	4		1	3		7	4							
Roumania	1					2								
Servia	1			1			1							
Portugal			1			1	3	1						
Mexico						1	1	2						
Hayti						1								
Total	30	5	14	13		35	84	10	6	14	20	9	6	6

Countries.	Group IX. Horticulture.						Social Economy.	Total each country.
	78.	79.	80.	81.	82.	83.		
France and Colonies	6	7	4	6	4	4	24	830
Netherlands								21
United States of America							1	59
Austria-Hungary								20
Sweden and Norway								17
Belgium		1					2	69
Denmark								9
Spain								23
Great Britain and Colonies							2	56
Greece								8
Italy							2	28
Finland								6
Russia							1	26
Switzerland								38
Egypt								5
Japan								12
Brazil								13
Central South America								63
Luxembourg		1						5
Roumania								10
Servia								5
Portugal								13
Mexico								2
Hayti								3
International Section								3
[illegible]		1						14
[illegible]								1
[illegible]								1
[illegible]		1						1
Total	7	10	4	6	4	4	32	1,378

LIST OF UNITED STATES JURORS.

UNITED STATES GROUP JURORS, PARIS EXPOSITION, 1889.

Vice-President Group II. Somerville Pinkney Tuck.
Vice-President Group VI. R. H. Thurston.
Vice-President Group VIII. Capt. D. A. Lyle, Ordnance Department, U. S. Army.

UNITED STATES CLASS JURORS, NOMINATED BY THE COMMISSIONER-GENERAL.

	Class.
Rush C. Hawkins, W. T. Dannat, Charles S. Pearce, and Paul W. Bartlett	1, 2
Henry S. Bisbing	3
Julius L. Stewart	5
C. Wellman Parks	6
Walter A. Donaldson	7
Theodore Stanton	9
H. G. Rogers	10
Charles S. Hastings	12
A. G. Dickinson	13
A. L. Roteh	15
George W. Hayes	16
Hillyard Lee (State Commissioner from Maryland)	17
W. E. Ingersoll	18
Charles Colne	19
Anthony Pollok	20
Henry B. Shope	22
Jacques Schieb	24
Lazard Kahn	27
W. Herrick	28
Max Hellman (State Commissioner from California)	29
Max Wasserman (State Commissioner from California)	30
A. Van Bergen	35
James Rumrill	36
Emile Levy	37
Aaron Ward	38
D. W. Seligman (State Commissioner from Montana)	39
W. H. Chandler	41
David Cahn (State Commissioner from California)	42
C. N. Haldeman (State Commissioner from Florida)	44
S. B. Newberry	45
J. M. Crafts	46
A. H. Reitlinger	47
Henry M. Howe	48
W. S. Ward	49

	Class.
A. H. Clark	50
W. W. Evans	51
R. H. Thurston and Prof. C. B. Richards	52
Charles R. Goodwin	53
S. N. Gotendorf	56
E. W. Serrel, jr	57
Thomas J. Sloane	58
C. S. Ward	59
Dr. Thomas W. Evans	60
H. B. Plant (State Commissioner from Florida)	61
Carl Hering and B. Abdank	62
A. G. Wilkinson	68
James Cheesman	69
Alfred Schweizer	70, 71
A. Bailly-Blanchard	72
C. McK. Loeser	73
C. Richards Dodge	73 bis.
D. A. Lyle	74
John F. Darr	75

Somerville P. Tuck—Social Economy Section.

REVIEW OF SOCIAL ECONOMY

SOCIAL ECONOMY.

Social economy is the question of the day. The energetic and fearless young Emperor of Germany has summoned a congress to consider this grave and important question. France and England have agreed to take part in it, and there can be no doubt that Germany's allies, Austria, Hungary, and Italy, will also be represented. When an imperial government acts on the great question of the relations between capital and labor, it is time that the republican government of a manufacturing country should act too. The United States would therefore do well to take advantage of the Exposition of 1892 to hold a *practical* congress on this subject. A Government exhibit at Chicago of facts and figures, illustrated with drawings and models, like that at the Exposition of the Champ de Mars, could not fail to be of public utility. Our Government has great facilities for this work through its army of postmasters, but especially at this time when its census-takers are busy collecting statistics. A report on the results of such an exhibit, published in due time, and distributed by members of Congress among their constituents, would give masters and workmen valuable information, and probably benefit both.

With this view it is proposed to give in this report a condensed account of the constitution of the Exhibition of Social Economy in the great Exposition of 1889. We are compelled to condense, and therefore omit whatever appears to be applicable to France alone, or at least not applicable to the United States. We trust that the information thus given may serve at least as a basis of action, either on the part of the Government, or of the organizers of the Exposition of 1892.

We begin with the orders of the Minister of Commerce and Industry, who was the Commissioner-General of the Exposition.

The Minister of Commerce, etc., Commissioner-General, orders:

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ARTICLE 1. An Exhibition of Social Economy is organized at the Universal Exposition of 1889. This Exhibition applies to manufactures and to agriculture. It is divided into fifteen sections, comprising the objects enumerated in the annexed memorandum. (A sixteenth section was added later.)

* * * * * * *

1. The Exhibition of Social Economy comprises first, institutions of private initiative, created by the employers, or by the employed, or by a union between the two, to alleviate the moral and material condition of the latter. Second, institutions and establishments created and kept up with the same object, by the state, cities, arrondissements, or other competent authority, as well as by associations or individuals:

2. A methodical series of questions shall be prepared by the commissioners on organization, in such a form as to guide the witnesses and the examiners, and to facilitate the examination and the classification of the answers.

* * * * * * *

3. Exhibitors are particularly requested to join to the documents, statutes, reports, books, and memoirs which they may exhibit, articles calculated to attract attention, such as models, drawings, plans in relief, photographs under glass, in albums, or on pasteboard, pictures, etc.

4. A library shall be collected for each category of subjects comprised in this exhibition, containing the most important books and documents relating to the category; laws, regulations, official reports, reports of scientific congresses, newspapers, and special publications on social questions and provident institutions.

* * * * * * *

8. The administration may place in one or several of the workmen's dwellings exhibited in Section II, collections or specimens of furniture, costume, clothing, and articles of household use.

9. The administration may set up before the eyes of the visitors small workshops of the domestic industries, indicated in the programme of Section XV.

10. Conferences on social economy will form part of this exhibition.

That eminent author and statesman, M. Léon Say, was then appointed president of the Exhibition of Social Economy, and was assisted by a large number of senators, deputies, professors, and experts. The exhibition was thereupon divided into fifteen sections, each section having its committee, consisting of a president, vice-president, and secretary, and four members. These gentlemen pre-

changes, all the memorable examples, all the successful benevolent institutions, which, thanks to the judicious observance of the laws of social and industrial economy, have provided for the people new elements of moral and material prosperity in the present, and security for the future. It would be well, too, to show by facts and in a striking manner that, under the empire of modern laws and of the liberty of industry, immense progress—too often overlooked—has been made during three-quarters of a century, and continues to be made to-day, without violence and even without noise, by the natural improvement of ways of life, the irresistible pressure of public opinion, and the peaceful triumph of just ideas. We should recall, too, the condition of the workman when delivered to the abuses of the tax-gatherers; his labor was oftener abused than protected by the rule of corporations.

We cannot to-day better glorify the work of 1789, and the liberation of industry by the French Revolution, than by showing the admirable results produced in the entire world by the impulse of individual independence, combined with the principle of association. This should be a complete picture of one of the greatest economical and social evolutions of humanity.

We shall attain this end by creating in the Exposition a new group, exclusively consecrated to social economy, which shall comprise in a sufficient number of classes the ensemble of the sources of prosperity, and a complete tableau of provident institutions, of dwellings, and of co-operation under all its forms.

We shall thus place in relief all the institutions created by employers in favor of their workmen, by the workmen themselves, or by the state or cities, to ameliorate the physical and moral condition of workmen, accustom them to economy, teach them the advantage of co-operation, stimulate their initiative, and, while providing them healthy habitations, facilitate their becoming owners of them. We shall call public attention to useful examples, and by an effective propaganda, based on experience and well-ascertained facts, contribute to develop harmony among all those engaged in the same work.

To prepare this Exhibition of Social Economy, we must first have recourse to preliminary inquiries.

In connection with the above "Exposé des Motifs" Mr. Georges Berger, the intelligent Director-General of the Management of the Exposition, issued a circular, part of which we translate:

We must repeat that in preparing this new exhibition, it is important to speak to the eye as well as to the mind, and that subjects which are treated in documents and statistics should be illustrated by maps and plans in relief, and by illustrations, so as to put under the eyes of visitors facts which might otherwise remain buried under a mass of figures.

In this point of view collective exhibits should be encouraged.

We must give this exhibition an agreeable and lively aspect, and make palpable and impressive, by all the material means we can command the economic facts which are to be shown. The administration will, no doubt, do all in its power to give this enterprise the decorative and picturesque character which ought specially to stamp it, but the committees and exhibitors must be moved by the same motives in order to give it body and life.

MANAGEMENT—GENERAL PLAN.

Mural maps and illustrated tables should play an important part in making figures and essential facts appreciable by all visitors. We might place in the sections of trade corporations and mutual aid societies, ancient and modern banners, insignia and medals symbolic of the history of these corporations; and alongside of doc-

uments relating to apprenticeship, the work of the apprentices themselves,—flowers, feathers, painting, jewelry, drawing, etc. .

The section of workmen's dwellings ought to contribute their special physiogomy to this exhibition. It would be well to construct specimens of natural size, which the exhibitors will no doubt construct themselves, and in which might be placed furniture best adapted, as regards both health and economy, to the wants of a workman's family.

If it were possible to construct in the center of this Exposition a workmen's club, with all its dependencies, including a lecture-room, we might place in it, in a pleasing form, many articles having reference to social economy, busts and portraits of deceased persons distinguished for their devotion to the working classes and for their self-sacrifice; and specimens, models, and drawings of the tools, clothing, and dwellings of workmen and peasants at different periods, so that the visitor could see at a glance the changes made in a century in their manner of living and of work.

Around this club might be grouped popular establishments, such as cheap restaurants or refectories, dispensaries, temperance coffee-houses, models of bath-houses and laundries, etc., the whole arranged with taste. We might erect, too, workmen's dwellings on the lawns and in the shrubberies, which will ornament the many thousand square meters assigned to the Exhibition of Social Economies.

Besides these separate buildings, there should be a main building in the rear of the grounds, to accommodate the fifteen sections with their documents, their tables, their designs, etc.

* * * * * * *

Finally, the object is to show by preliminary inquiry and by exhibition a complete and impartial inventory of the economic and social question at the end of the nineteenth contury—its successive changes, its actual condition, and what is to be desired for it.

We should all, from love of country, and with a noble aim in view, study closely and with ever-increasing zeal the questions relating to manufacturing and agricultural labor, encourage legitimate hopes, bring prominently forward institutions which have succeeded, solutions reached by the free action of individuals or of associations; place in full view efforts heretofore unrecognized, assist badly in-

every way. The different paragraphs were numbered in order, and without regard to the section to which they belonged, so that in answering the writer had simply to place a number without further heading on his sheet, and proceed with his answer.

It may be well to give these questions in one of the sections in order to illustrate the method of proceeding. In the other sections we shall give the heads alone. We select the first section, as perhaps the most important.

SECTION I.—REMUNERATION OF LABOR.

I. *Miscellaneous, concerning the factory and its management.*

1. ***Describe the establishment.***—State what is manufactured (arrangement and division of the workshops—amount of business done—hands, how many—distinguish between the sexes, and give the ages of children). Recruitment (local or foreign, details by nationalities)—stability or instability (meaning are the workmen often changed).

Conduct of the work. Periods of activity and of stoppage. Are they regular or intermittent?

Yearly amount of wages. Its relation to the amount of business.

If the question has reference to agriculture, name the total area and the division of the land for different crops; rotation of crops; mode of working; laborers: annual crops.

Other details characterizing the workshop or its management.

II. *Factory wages.*

2. *Method of fixing wages.*—Are wages paid by the day, the hour, the job, or by a percentage? Are they fixed by a combination of these methods? Are there different methods applied according to the character of the work? What are these kinds of work? Do the wages depend upon the price of the goods?

3. *Supply and demand for labor.*—Mode of recruitment; hiring; guaranties required (references, diplomas, inquiries); intelligence offices; labor exchanges (origin, organization, results).

4. *Rates of wages.*—Rate by classes in the mill; men, women, children. (Give the highest, the lowest, and the mean rate).

Compare the rates of wages according to the different methods of fixing them (day, percentage, etc.); state if several of these methods are adopted at the same time.

Fluctuation of wages for a quarter of a century (go further back if it can be done with accuracy), both in the mill itself and in the neighborhood.

Give annual remuneration of a good, ordinary workman (taking into consideration stoppages in the dead season and at other times).

Compare earnings of families who work also outside of the workshop; in the fields, for instance.

5. *Bounties, or additional wages.*—Are there in the factory, besides wages, bounties calculated on one or several of the following principles:

a Quantity of work done in a day, fortnight, or month, beyond a fixed mean.

b Quality of the work.

c Economy realized in the use of raw material or fuel.

d Longevity.

Indicate the plan of these different combinations, and the basis of application. At the end of what period are the results known? Are these bounties offset by a reduction of wages if the quantity and quality of the work fall below a certain standard, or if the consumption of raw material is excessive? Does the calculation of these bounties give rise to disputes?

In the absence of or in addition to these bounties mathematically fixed, are there others given by the employers at their discretion? Total amount of such bounties for all the employés, and for each of them.

6. *Allowances in kind.*—In addition to wages and bounties do the workmen receive subventions proportioned less to the work than to the needs of the family? In what do they consist?

(*a*) Dwellings at lower rents, or free; gardens, fields.

(*b*) Warming.

(*c*) Medicines and medical attendance.

(*d*) Schools.

(*e*) Provisions and service, gratuitous or cheaper. (Transportation and clothing of railroad employés.)

(*f*) Prescriptive rights of custom on the property of the proprietor.

The annual amount of these allowances, total, average per head. Their relation to the amount of work done in the factory, and to the amount of the dividends.

7. *Rules of labor.*—The mean length of work (by day, by week, by month, by year, Sundays, fête days); stoppages.

Does the workman add field labor to factory labor to fill up the time of stoppages?

Number of years of labor before superannuation; incapacity arising from the character of the work: mortality; condition of the workman in old age.

8. *Encouragements to labor and to longevity.*—Special advantages accorded to workmen to favor permanence of engagement (longevity bounties; sick bounties; light labor reserved for infirm or old men; preferences enjoyed in the selection of vacant houses; pensions). Money value of those advantages.

Medals and prizes to reward the quality and faithfulness of the work, and reciting the condition of old and meritorious workmen.

9. *Payment of wages.*—Division of pay-days (by month, fortnight, or week); in-

11. ***Relations between wages and the expenses of living.***—Comparative condition of the workman as regards resources and expenses to-day and at different periods, going back as far as possible, in the same neighborhood.

Has the increase of wages advanced more or less rapidly than the expenses of living? Has this increase been partly set aside as savings?

General condition of the workmen employed in the factory and in the neighborhood.

III. *Agricultural wages.*

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Sufficient has been given to show the form and character of the questions. We proceed now to give the heads under which questions were prepared in the other sections.

SECTION III.—PARTICIPATION IN PROFITS—CO-OPERATIVE SOCIETIES.

I. *Share of profits.*

22. Nature of the industry and general information.
23. Percentage which the wages bear in the manufactured article to the other expenses of production.
24. Proportion and bases of the payment to employés and workmen of a share of the amount of net profits.
25. Powers of the employer.
26. Mode of employment of the workman's share of the profits.
27. Material and moral results of the share system, for the workman and for the masters.

II. *Industrial co-operative societies.*

28. Nature of the industry and general information.
29. Modes of raising the capital.
30. Formation of the management.
31. Number and condition of the associates.
32. Method of dividing the net profits.
33. Rights of apprentice candidates for admission.
34. Fruit growers' associations; cheese factories.

III. *Farming on shares.*

35. Nature of the work and general information.
36. Proportion and conditions of the division between the proprietor and the farmer.
37. Special clauses.
38. Material and moral results of farming on shares.

SECTION III.—TRADES UNIONS.

I. *Trade associations.*

39 Miscellaneous, applicable to all syndicates.
40 Syndical association of employers.
41 Syndical association of employés (Trades Unions, Knights of Labor, etc.).
42. Mixed syndicates of masters and workmen, or of employers and employés.
43 Relations between syndicates of employers and of workmen.
44 Agricultural syndicates.
45. Trade associations abroad, corporations, open or close.

II. *Councils of conciliation—tribunals of arbitration—councils of arbitrators.*

46. Councils of conciliation; tribunals of arbitration.
47. Council of arbitrators; trade tribunals.

III. *Learned and business societies for the study of social questions.*

48. Societies of social economy; industrial societies and others.

SECTION IV.—APPRENTICESHIP.

I. *Apprenticeship in the workshop.*

49. Miscellaneous, in regard to the workshop.
50. Relations between the employer and the apprentice.
51. Methods of apprenticeship.
52. Results of the apprenticeship.

II. *Technical instruction.*

53. Schools of apprenticeship peculiar to the workshop.
54. Study outside of the workshop.
55. Technical schools.
56. Housekeeping schools, to teach young girls housekeeping.
57. Orphan asylums; manufacturing or agricultural workshops.

III. *Employers' associations.*

58. Nature, object, and advantages of employers' associations.

SECTION V.—MUTUAL AID SOCIETIES.

I. *Miscellaneous.*

SECTION VI.—SUPERANNUATION SOCIETIES AND ANNUITIES.

I. *Official institutions.*

74. Description of the institution.
75. Management and administration of the funds.
76. Rules relating to the pensions paid by the State.
77. Members and pensioners.
78. Financial results.
79. Pensions on the retirement of State functionaries.

II. *Institutions founded on the initiative of the parties interested.*

(See Sections III, V, IX, and X.)

III. *Institutions founded on the initiative of the employer.*

80. Organization and working of these institutions.
81. Funds of provident societies.
82. Financial results.

SECTION VII.—INSURANCE AGAINST ACCIDENT.—LIFE INSURANCE.

I. *Insurance against accident.*

83. Basis of insurance, and general information.
84. Methods of insurance.
85. Civil responsibility of the employer.
86. Working of the insurance.
87. Premiums or assessments.
88. Rules in case of accident.
89. Funds in case of accident.
90. Results of the insurance.
91. Diverse peculiarities.

II. *Life insurance.*

92. Employés insured.
93. Conditions of the insurance.

III. *Diverse kinds of insurance.*

94. General information.

IV. *Insurance companies.*

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We continue this article with extracts from an able and interesting speech of Mr. Léon Say upon Social Economy, delivered at a dinner of the presidents of the many mutual aid societies in Paris.

If I am glad to find myself among you to-day, I must not forget what has procured me this honor. I am here, as you have said, sir, in my quality as President of the Committee on Organization and of the Jury of the Exhibition of Social Economy. I am proud to have had a share in the great work of the Exposition of 1889, and I am grateful to the Head of the State, and to the President of the Council, Mr. Tirard, for having done me this honor.

We have all visited the galleries of the Esplanade des Invalides, and I can say, without deceiving myself, that we, who for many years have perseveringly studied the questions of social economy, have learned there many things we did not know, or knew imperfectly. We can now understand much better than we did before, the importance of the questions which press upon the attention of the nation. We know

better the methods to be employed, I will not say to solve the social question, for this will last as long as the world, but to clear up a number of difficult problems, the solution of which ought to bring us near to a state, not of perfect happiness—humanity will never know this—but which will enable us to ameliorate from day to day the condition of the poor.

In passing through the galleries of the Exhibition of Social Economy, in seeking to digest as well as possible the many ideas born of a close examination of the different objects exhibited, I understand better than ever the rôle which the nineteenth century will play in the history of the human race, and I have found myself better able to characterize it as it probably will be characterized by future generations.

The nineteenth century will have been the century of great industries, the century in which man will have learned to avail himself more and more of the forces of nature, to make use of them, and to create instruments destined to augment the mass of social riches.

We have learned in this century, thanks to the men of genius who have made it famous, that we can imprison the forces of nature, shut them up in machines and in tools, and give to these machines and tools movement and, so to speak, life. These forces, whose nature we do not know, we know in their effects. It is weight latent in the wind, in the water-fall; it is the expansion of gas and steam; it is heat; it is electricity. We have learned that these natural forces can act on instruments, and we have discovered the possibility of forcing these instruments to work to their own exhaustion, even to their own destruction, that they may serve us more completely. Connected with this, philosophers have asked themselves if among these agents should be counted a force, equally a force of nature, which is also incorporated in organs. I mean man's own force, his vital principle, his intelligence; in a word, his soul. The pessimists are alarmed at the thought that this force, imprisoned like the others in organs, not of steel, but of flesh and muscle, may be exhausted to its own destruction in order to give to the human race greater riches; to create more occupations. When we see that the progress of industry consists in destroying the machine, we ask what will become of the human machine, what we will do with it if we do not destroy it, too, in the fly-wheel of modern labor. Do we not hear great engineers say every day that we do not use our machines enough? In the railroad congres es held during the last few years in Europe, have we not

We have been able to observe practically the difference which thinkers had pointed out, by means of the different institutions of which we have seen models in our galleries of the Esplanade des Invalides. These institutions may be divided into three grand classes. The largest, which I shall call the "Central Class," is that of provident institutions, with their different branches, in which the mutual principle is the most conspicuous. This forethought is the human soul itself; it is individual initiative; it is man thinking of his family and of his own future, seeking to issue from the embarrassments amid which he was born, and to issue from them worthily by a moral effort.

This is the point of departure of all the progress to be made. In the first rank of our social studies we must place that which pays homage to forethought, to economy, to the moral effort which produces dignity, and which with this dignity generally brings the commencement of prosperity.

Around these provident institutions, and supporting them, or making use of them, you see on one side employers' institutions, and on the other the institutions of the great, the too great employer—the state.

Employers' institutions were conceived a long time ago in a very different spirit from that of to-day. Formerly help was extended to the workman from without; it was a kind of charity. It was the same with the state institutions. The state took the money of the tax-payers to employ it in giving help to the poor. This was the "Assistance Publique," a necessary assistance which cannot be too highly praised, or organized with too much care. To-day the state tries another method. It seeks not only to help the individual from without by assistance: it seeks to put him in a position to help himself.

What have we seen in the exhibition? We have noticed a happy transformation, singular at first sight, but very real and very salutary. The employers' institutions have developed and produced their best effects when they have aroused the initiative of the workman. They have best succeeded precisely where, so to speak, they kept themselves most out of sight, the employers allowing their employés simply to use their strong organization, and so enabling them to improve the institutions themselves. We have examined a number of examples, and if this fine exhibition is to be preserved, as we hope, and as we have requested, the public, which knows little of them yet, can study them closely, and understand how employers' institutions do not suffocate individual initiative, but, on the contrary, develop it more and more. Those institutions, which unfortunately still run on in the old ruts, are entitled to our consideration. They were philanthropic works, which we should admire in admiring the devotion and charity of those who established them. But we may be sure that they will do much less good than the others, and a good much less durable.

There are many proofs of what I now advance in the Exhibition of Social Economy. Mr. Charles Robert, who is seated by my side, understands these questions thoroughly; he can give you the history of some of these employers' institutions. Our absent colleague, Mr. Cheysson, can do so also, and I am sure that he will; and you will see, when your attention has been called to the subject, what I have seen myself, the considerable progress obtained by the new methods.

I hope that the history of employers' institutions will be illustrated in the Museum of Social Economy, whenever we can bring together the documents which the exhibitors will leave us. The President of the Council is trying to create this Museum. He has told me that he shares our views, and is waiting to carry the project out until he can be sure that he can place at our disposal sufficient space in the exhibition buildings which are to be preserved.

We see the state also sometimes takes the initiative, which in some countries I used to be deplorable. We have seen in these late years the state try to play the part of the benevolent master of old times, an honorable rôle in the eyes of those

who wish the state to play it. but which, in curing individual ills, does not permit the ills of humanity to be cured.

There are states which desire to become the Providence of the poor. A great empire adjoining us has developed this idea, and has realized it by state socialism. For my part, I do not envy their state socialism, and I earnestly hope that we shall not be seduced by the example. It would be fatal to our country. I know, however, from having studied the question in detail with my colleagues, that there are excellent things in the efforts made in Germany. We ought to profit by the methods they have devised for ascertaining facts, and by the important researches they have made, thanks to their well-organized and active statistical bureau.

But once more, leaving aside the great economical and statistical works to which I have alluded, I should not consider it a happy result to transform men into soldiers, to enlist them, in order to force them to apply themselves to all the needs of industry. This pantheism of the State is not what I dream of for my country.

We have also noted the efforts made in other countries which have sought to make reforms analogous to the German reforms, without leaving all to the state. Thus in Italy, efforts have been made to employ the influence of the state in arousing individual initiative. If we must imitate the foreigner, we would do better to turn our eyes to this side.

We have in our own country a state institution which has aided and will continue to aid provident institutions to make great advances. It is the National Bank of Superannuation. The directors of this bank have accomplished a work which none of us could have undertaken with success, which all your societies together, numerous and devoted as they are, could never have realized. I speak of the remarkable tables of mortality which have lately been published.

Here is an example of the service which the state can render, doing what individuals or associations cannot attempt, and so giving them an instrument of progress.

I do not say that the rôle of state ought to be confined to these narrow limits. I know well that the attributes of the state have a tendency to increase. It is in fact impossible to trace an immovable frontier between the attributes of the state and those of private initiative, because, according to the age, according to different modes of government, we shall be forced to advance or to withdraw this imaginary

grant annuities and pensions. You know that in certain countries—once even in this—the union of superannuation banks and mutual aid societies is forbidden. We have now adopted in France a different rule: we unite life insurance and insurance against sickness.

This juxtaposition of these different functions leads to much confusion in the management of certain societies. Has our legislation solved this difficulty? I am not sure, for we have seen strange things, and we have had to ask ourselves how we are to distinguish between rich societies and poor societies. We have met with societies that were rich because they were in a bad condition. This seems to be a paradox, but it is only apparently so. In fact, if a great number of Frenchmen were to die to-day, leaving their property to their children, these children would be enriched, but France would have lost a part of its strength. Well, we have seen mutual aid societies which have grown rich under these circumstances. The number of their members have diminished, and their reserve funds are called upon to meet reduced demands. But a time will come when these societies will disappear for want of members, and all the efforts once made to create them will have been made in vain. This is a very disquieting symptom.

It was our duty to call the attention of the presidents of the mutual aid societies to this matter. We consulted them; we asked them if it would not be prudent to establish the funds of these societies on a basis which has been called "scientific." They answered that this was their wish, but they added that you cannot treat a mutual aid society as a simple insurance company, for an insurance company should have its funds so invested that at any moment it can turn over its business to another company, which must meet all the engagements of its predecessor. We were told that mutual aid societies ought to trust, to some extent, to the sentiment of fraternity which unites their members. I do not deny that there is a great truth, a consoling truth, in this manner of looking at the question. I do not say that mutual aid societies should not count on the aid of those who are, or will be later, members of it; but still I remain convinced of the necessity of greater precision in establishing the reserve fund of mutual aid societies.

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Mutual aid societies are societies which do business; they are also brotherly associations, and as such should be allowed to develop very freely. But I repeat, they do business, and when a society does business, it must be subject to the laws governing business societies. It is the duty of the law to intervene. This is for the general interest.

Before ending, I want to speak to you of another question pending before the Parliament—mill accidents, and insurance against them. I have studied all that was exhibited on this subject in our Gallery of Social Economy. I have admired the excellent tables exhibited by Mr. F. E. Gros, of the Society of Mulhouse, and I have noted all that has been done to organize insurance against accident in different countries. We were able to examine the excellent organization of insurance against mill accidents in Italy, and to consult documents of the highest interest. I hope that you will be able to study them at your leisure in our museum.

We did not have at the exhibition the laws made in Germany on this subject, but we have secured them since for purposes of comparison. Considerable difficulties exist in legislating on insurance against accidents, and those persons who want questions settled without difficulty, would refer the whole question to the State. But I do not like such simple solutions, for I believe that this simplicity does not exist in the nature of the subject, and we ought to see if we cannot find among complex solutions which correspond better with the spirit of initiative of the French nation. There are solutions, I do not doubt, much nearer what I should call "social truth," which we are always aiming at without ever touching, and these solutions are infinitely better than those which have been proposed thus far.

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What we aim at is to improve the relations between man and man, and to make them conform better to the laws of justice and morality.

* * * * * * *

We have learned from the Exhibition of Social Economy how difficult is the solution of social problems. I trust that my compatriots will dwell upon this truth. I know young men who are all ready to settle these problems with a stroke of the pen; their hair will be white before they arrive at their practical solution. Finally, what is the duty of our generation? To strengthen in France the government of the democracy by itself. It is a difficult problem, but not beyond our strength. The Republic for twenty years past has learned what are storms and hurricanes; she has shown that she knows how to defend herself. The dangers which she has run, far from weakening, have strengthened her.

PRIMARY SCHOOLS WITH MANUAL LABOR.

We propose to add a few lines upon the primary schools of Paris, intended more particularly for the children of workmen, and giving gratuitous primary instruction in the simplest mechanical arts. This is a very important element of social economy.

During the time of the Empire, France was gradually losing her pre-eminence in the tasteful and artistic work which produced the articles generally known as "articles de Paris." Germany, and especially Vienna, was taking this valuable trade from her. The Government of the Republic felt that something must be done. They thought it was not to be tolerated that a people pre-eminent for its taste, and for lightness and delicacy of touch, should be gradually falling behind other nations in workmanship requiring eminently those qualities, and especially when these other nations were Germans. The Government naturally came to the conclusion that this superiority of their neighbors across the Rhine could arise only from technical education, and they proceeded at once to estab-

there; books, stationery, etc., are also furnished gratis. The school age is six to twelve years. Altogether over 200,000 children are educated in Paris in the public schools. The annual expense for primary schools is 13,500,000 francs (about $2,700,000).

The public school system commences with the kindergarten schools, of which about 126 are now in existence, with 30,000 children, ranging in age from two to six years. The expense of their maintenance is about 67 francs (about $13) for each, or a total of 2,051,000 francs (about $410,200).

And first, let us begin at the beginning, and say a word on the

KINDERGARTEN SCHOOLS.

They are certainly more than a benefit to the working class—they are a blessing to them. The parents are freed from care and anxiety during the working hours of the day. Their little ones, under the charge of trained kindergarten teachers, are well looked after, and have instilled into them, in early life, notions of work, order, and neatness, besides much useful knowledge—benefits of no small advantage for the time being, but also destined to bear good fruit beyond the period in which they are received. The attendance averages from 150 to 200 a school, and in some of the largest as many as 400 children. The hours are from 8 o'clock in the morning to 6 o'clock in the evening in winter, and from 7 o'clock in the morning to 7 o'clock in the evening in summer. The children get soup at 11 o'clock, and bring with them whatever else they may want to eat during the day.

The first article of the law of the 28th of March, 1882, makes manual labor instruction obligatory in the public schools. The decree providing for kindergarten instruction prescribes that the manual exercises shall consist of plaiting, twining, folding, and knitting. Sewing and all other work which might fatigue the children is prohibited.

Everything is done to keep the children interested in what they do. All instruction, ciphering, writing, etc., is carried on so as to leave them always under the impression that they are playing and not doing anything of a serious nature. It would be useless to go into details on this subject; we only refer to it as part of the public school system of France, where everything now tends to bring the minds of the growing generation as much as possible into relationship with the active, living world; to train them in handicraft work, and to emancipate them as much as possible from the dullness of the school routine of the good old times. It must be seen from this that the tendency is to conduct education, from the first beginnings up to the highest training, so as to educate the mind through the senses, and to lead the pupil well prepared into the great open field of industrial life.

We come next to

BOYS' PRIMARY SCHOOLS WITH MANUAL LABOR.

Of the 285 boys' primary schools in Paris, there are now 90 which have more or less spacious and well-fitted workshops for working in iron and wood. The system of instruction is much the same in all, operating on the same basis, and in nearly the same shapes and forms, though in some it is more highly developed and better organized than in others.

The younger classes begin by making paper objects, card-board boxes, and the like, covered with colored paper, and work them up into fancy paper articles.

Some schools have only recently begun with these classes, and have not yet a full equipment; others are older, and show generally very good results. One of the less advanced schools was only doing wood work, and in the lower class paper work. Great dissatisfaction existed among the boys, because they could not get more time to spend in the workshops. They were employed in planing, sawing, and turning. The school was promised additional room for iron-work and for the opening of a modeling class.

The workmen instructors superintending the manual training classes are paid at the rate of 1½ francs per hour.

(1) *The wood-work shop* is the largest. For primary school purposes, wood-working is perhaps most conducive to the elementary training of the hand.

There are twelve carpenters' benches, in two rows in the middle of the room, each bench for two boys, working at the same time; and along the wall, near the windows, four turning lathes are placed. Each of these lathes is worked by three boys. One is employed a

At the lathe they commence on a plain stick of a certain height, which is turned into as many as seventy-six different ornamental pieces, made either to stand separately, or to fit into others, and by combining produce a finished object.

(2) *The workshop for iron* contains twelve vises, four at each side wall, and four at one end of the room, leaving the middle part of the room open for the instructors to go round and examine the work while the boys are busy filing. In addition, the fully equipped schools are provided with a boring machine, anvil, and forge.

In the use of iron they also start from a plain piece, and work this into various simple geometrical shapes and other forms, by the application of the file.

For forging and hammering lead is used, as it demands less muscular strength than iron.

The following is the programme arranged by the school authorities for workshop practice in primary schools:

MANUAL EXERCISES INTENDED TO DEVELOP THE CHILDREN'S SKILL OF HAND.

Elementary class.

(Seven and eight years old. One hour per day.)

Elementary exercises in free-hand drawing, symmetrical arrangement of forms, cutting out pieces of colored paper and applying them upon geometrical forms, exercises in coloring, cutting out geometrical forms in card-board, representations of geometrical solids. All these exercises to be done first on paper ruled in squares, and subsequently on plain paper.

Small basket work. Arrangement of strips of colored paper: (1) In interwoven forms. (2) In plaited patterns.

Modeling: Reproductions of geometric solids and simple objects.

Intermediate class.

(Nine and ten years old. One hour per day.)

Cutting out card-board patterns, construction of regular geometric solids, construction by the pupils of card-board models, covered with colored drawings or colored paper.

Small basket work; combination of plaits; basket making. Objects made of wire; trellis or netting; wire chain making.

Combination of wood and iron; cages.

Modeling simple architectural ornaments.

Object lessons: Principal characteristics of wood and the common metals.

Upper class.

(Eleven and twelve years old. Two hours per day.)

Drawing and modeling; continuation of the exercises in the preceding class; repetition of the ornaments, previously executed, in

the form of sketches, with dimensions attached to them; drawing the requisite sections for this purpose; reproducing the sections as measured sketches; study of the various tools used in working wood, hammer, mallet, chisel, gimlet, center-bit, brace, screw-driver, compasses, square, marking-gauge, saws of different kinds, jack-plane, trying-plane, smoothing-plane, files and rasps, level.

Theoretical and practical lessons in the above.

Planing and sawing wood; construction of simple joints.

Boxes nailed together, or jointed without tacks.

Wood lathe; tools used in turning; turning simple geometrical forms.

Study of the tools used in working iron, hammer, chisel, cutting tool, cold-chisel, squares, compass, files, etc.

Theoretical and practical lessons concerning them.

Exercises in filing, smoothing, and finishing rough forgings or castings (cubes, polygonal nuts).

The practical work in the shops in primary schools is to be followed by gymnastic exercises, in accordance with a special programme.

It is expected that this workshop practice will soon be extended to cover all the primary schools of Paris handiwork, like that described above, in the boys' schools, and work serviceable for girls' occupations in after life, in the girls' schools.

The children in these boys' schools get all their meals during the day in the school, if their parents so choose.

This provision of wholesome, warm meals for the children in the middle of the day cannot be too highly commended.

All schools are provided with kitchens and refectories, *i. e.*, dining rooms.

they perhaps would not have at home, and would certainly be utterly deprived of if thrust into the streets to grow up in ignorance and vice. The poorest child is thus made to love the school, which, besides giving it instruction, also supplies it with that which is certainly nearest to its heart—food and raiment and shelter against cold and inclement weather.

The work of these primary schools is largely devoted to making toys for the children in the kindergartens. Thus the boys have an object for their labor, the younger children are amused, and the expense of toys is saved to the school fund.

One of the most pleasing features in this institution of manual labor is the pleasure it gives the boys. They go at their work with a will, and look upon it more as a reward than a task. The teachers speak highly of the system in its beneficial effects upon the theoretical studies. They regret that it is not practised in all the primary schools, but expect that in a few years it will become universal.

Thirdly, we come to primary schools for girls.

The girls' primary schools give instruction in sewing and in the higher classes in housekeeping.

Needle-work practice in the primary schools is aided by oral instruction given by the teacher, with illustrations on the blackboard. The pupils have to bring their own materials. For this course one hour and a quarter per week is given.

The first course consists of marking and making all the different stitches employed in canvas embroidery; the second in sewing running-stitch, back-stitch, and overcast-stitch; and the third in applying these to hems and seams, making plain and felled seams.

The middle classes have one hour and three-quarters per week:

First, embroidery, and marking Roman and other plain embroidery letters on coarse linen and open fabrics.

Second, sewing different stitches and button-hole stitch, quilting, and button-hole making, applying the same to actual work executed. Drawing, mending, and patching, etc.

There is a third course where the same classification of work is kept up, conducted in a finer and more elaborate manner and on finer materials.

We are tempted by the importance of the subject to give a few lines to the "Superior Primary Schools for Girls."

Girls are not admitted into these schools until twelve years of age. The Ministry of Public Instruction has laid down the following programme for them:

(1) Housekeeping.

(2) Gardening.

(3) Farm work and dairy farming.

(4) Sewing.

(5) Designing, painting, and art education.

(1) *Housekeeping.*—The general prospectus laid down for their guidance prescribes instruction in the following subjects: Managing of an ordinary dwelling house, heating and lighting, care of furniture, care of household goods and linen, washing and ironing, baking, and ovens and ranges; pastry making; managing housekeeping materials, such as coal and wood; purity of water, purity of wine, vinegar, cider, beer, coffee, oil, grease, sugar, preservation and cooking of meat; qualities and choice of meats. Elementary principles of the kitchen; boiling, stewing, and roasting of different dishes, meats and vegetables; preserving of fruits, packing and transportation of fruits. Manufacture of candies, liquors, fruit brandies, and sirups; domestic book-keeping.

The pupils of these schools are required to spend some time in the kitchen attached to the school, going through the routine work of a kitchen.

(2) *Gardening.*—General notions of agriculture: Soil, manure, improvements, and different kinds of cultivation. Garden: General disposition of a garden, garden walks and divisions, hedges, wall fruits, tools employed in gardening, fruit gardening. General principles of aboriculture. Fruit-tree culture, with application to varieties indigenous to and most planted in the country; diseases of fruit-trees and destruction of insects. Kitchen gardening: Varieties, culture and harvesting of vegetables. Forced culture: Hot-beds, greenhouses, etc. Instruction in floral culture: Partly for ornament and partly for the manufacture of perfumery.

(3) *Farm-work.*—Dairy farming; making butter and cheese; general notions of keeping sheep and cattle; raising and feeding poultry, pigeons, rabbits, bees, and silk-worms.

HISTORY OF LABOR.

SECTION I.

ANTHROPOLOGICAL AND ETHNOGRAPHICAL SCIENCES.

One of the most interesting, if not the most interesting, exhibit in this marvelous Exposition was the Retrospective History of Labor. Since the fall of the Empire, the Government of the Republic has taken under its special charge manual labor and manual laborers. The science and intelligence of France are too striking and conspicuous to be ignored, but it is the workingman who has received most from the fostering hand of the Government.

In the Exhibitions of 1867 and of 1878 the history of labor was made a feature, but not a conspicuous one. At both these dates this department was exclusively French, or nearly so, beginning with the early history of Gaul, and ending with the Revolution of 1789. In 1878 private individuals loaned to the Government valuable and interesting collections, but they attached to the loan the condition that the articles should be kept together, without regard to the section to which they properly belonged. It was reserved for Mr. G. Berger, the able and indefatigable Director-General of the arrangement and management (*exploitation*) of the Exposition, to group the articles belonging to the state and those loaned by museums and by individuals, ethnographically and chronologically.

Mr. Berger divided the History of Labor into five sections:

(1) Anthropological and Ethnographical Sciences.
(2) Liberal Arts.
(3) Arts and Trades.
(4) Transportation.
(5) Military Arts.

It was his intention that each of these sections should be thoroughly subdivided by the committee in charge of it. In most instances this subdivision was completely and accurately made, but in others it was by no means complete. That distinguished statesman and orator, Mr. Jules Simon, was named president of this department, supported by such specialists as Admiral de la Gravière, Member of the Academy of Sciences; Quatrefages de Breau, Professor of the Museum of Natural History; Bouché, Graduate of the

Polytechnic School; and Faucon, Sublibrarian of the Library and Historical Collections of the City of Paris. Whatever such men did must necessarily have been well done.

In his letter calling the attention of the public and of amateurs to this important department of the Exposition, Mr. Simon says:

> This Exposition has especially a historical and technical character, but it by no means excludes objects of art; for at several epochs, tools, and especially those used in the liberal arts, were veritable gems, from their elegance of form, the richness of the materials, or the charm of the details. We find chefs d'œuvre on a map, on the handle of a chisel, or on the barrel of a gun. Our ancestors had not the same passion for speed and cheapness as we have. In this, trade lost, but the arts gained.

Anthropology, or the history of the human body, began this exhibit. Skeletons, skulls, and the casts of them, were first in order. The subject is not attractive except to the medical man, and we will confine ourselves therefore to observing that several of the skulls of prehistoric man exhibited marks of having been trepanned, and, of course, with a flint knife. Early surgery this! And to come to a later date, our attention was called to some of our own noble red-men—casts, happily—Little Medicine, Big Nose, White Bear, and other Cheyenne and Arapahoe warriors, who should have been hung for murder, but were only imprisoned. The Smithsonian furnished these interesting objects, and would no doubt furnish duplicates to our Exposition of 1892, should anybody want them. Italy, too, furnished a morbid collection of the skulls of criminals.

To leave this part of the first section, and come to Ethnography.

And here we observe some confusion in the terms archæology and ethnography, as used in France and in Denmark. The Danes use the first of these terms as embracing both anthropology and ethno-

descended into the valleys and plains, now remained fixed on the mountain sides. By convulsions of nature Europe was separated from Africa, and Great Britain from the continent. The work in stone improved. The stone was detached, and both faces were chiseled. Men lived in caves, and under overhanging rocks, and on the banks of streams rich in fish. Grain was unknown. This was the Age of the Reindeer. In the "période néolithique" the climate became more like that of to-day; though this winter of 1889–1890 seems rather to belong to the Age of the Mammoth. Man built dwellings upon the water. His flint was better finished, polished and carved, but still he used flint; and we prefer, therefore, the simplicity of the Danish nomenclature, the Age of Flint.

The Royal Archæological Museum at Copenhagen is, without question, the finest in the world. The Danes have been fortunate in the able and learned men who have devoted themselves to the study of the past, while the people generally stimulate the efforts of their experts by the intelligent zeal they take in the subject. The writer of this article was fortunate enough to know Mr. J. A. Worsaae, the late learned and intelligent Director-General of the Archæological Museums of Denmark. Mr. Worsaae's history is a romantic one. A fearful storm raged on the coast of Jutland, one of the most dangerous in the world—the Hatteras of Europe. Many vessels were wrecked; among others one believed to be a Portuguese coming from Brazil. The fishermen on the beach observed a plank tossed by the waves, drifting ashore. They drew it to land, and found a young child lashed to it. This child in time became a cabinet minister, and the learned Director-General of the Archæological Museums of Denmark. He was named from the little Jutland village near which he was rescued.

The Danes contributed liberally from their great archæological wealth to this section. More specimens were offered than could be received, and the choicest only were selected. These were sent from the museums of Copenhagen, Viborg, Randers, Odense, and Aarhus. They were arranged chronologically, beginning, of course, with the Age of Stone.

Flint hatchets, arrow-heads, horn hatchets, scraping knives, awls, etc., were in the first exhibit.

Then followed hammers, the hard points of antlers, knives and stones to polish flint, and as the workman became more skillful, pon[illegible]s, lance-heads, etc.

With these were exhibited ornaments of amber, which was at that period found in abundance on the coast of Jutland and in swamps near the coast. It is now found rather on the coasts of the German Baltic provinces. Amber is supposed to be the gum of pine trees, buried centuries ago by the ocean. It is washed up from time to time upon the shores, and is also found by digging in the swamps.

It is in Denmark that we find the best specimens of work in the Age of Stone. This is partly due to the quality of the flint, but principally to the fact that eastern civilization penetrated into southern Europe long before it reached the north. This gave the Scandinavians a longer period to improve their work in stone. The Age of Stone may be said to have lasted in northern Europe until about one thousand five hundred years before our Saviour.

The Age of Bronze followed the Age of Stone. Bronze being composed of copper and tin—as brass is of copper and zinc—mines of these simple metals must have been worked very early. The museums of Copenhagen are rich in ancient bronze ornaments, but, singular to say, these ornaments are supposed to have come first from other countries, brought by eastern and southern merchants, especially by the Phœnicians, and exchanged for amber. Indeed, the bronze bracelets, necklaces, etc., of the museums, reproduced at the present day in gold and silver in Copenhagen, and in Helsingfors in Finland, bear a striking resemblance to the work of the East Indian goldsmiths. The spiral bronze finger-ring, which is supposed to have been used as money, was undoubtedly copied from the golden serpent of India, and the massive gold Indian bracelet is to be seen in all the principal goldsmiths' shops of Copenhagen, copied from bronze models in the museum. These bronze ornaments were composed in those days (and when copied in bronze they are composed now) of nine parts of copper and one of tin. The Age of Bronze may be roughly said to have lasted from one thousand five hundred to one thousand years before Christ.

Following the arrangement in this section, we now come to the Age of Iron. This may be said to have lasted in northern Europe

The skillful and painstaking scientists who prepared them took unwearied pains to make their work perfect in all its details. They found among the aborigines of Australia men and women living in precisely the same way and engaged in precisely the same work; from them they took the general arrangement. But the bodies were reproduced from skulls and skeletons and bones found in France and Belgium; and the dress from wild tribes of our own day.

The second group was called "The Age of the Reindeer." A woman and a young man, sheltered by an overhanging rock, are carving reindeer horn, while the father of the family enters, bearing a quarter of venison. The bodies, the dress, the hair, every detail, were carefully reproduced, so as to give an exact idea of the horn carvers.

The third group, "The Age of Polished Stone," represented three men working on a funeral monument. The heads were copied from skulls found in the mounds of the Druids. Every part of the dress and of the tools was carefully reproduced from the originals or from reliable descriptions.

The fourth group, "The Age of Bronze," represented a founder and his apprentice molding in bronze. They stand near a rock and are protected from the wind by a screen of dead-wood. They wear leather aprons only, the apron of the blacksmith of to-day. A prominent object is the bellows, copied from an ancient Indian model, and intended to recall the Eastern origin of works in bronze. The crucible, the pincers, and the molds are copied from originals in the Museum of St. Germain.

The fifth group represented a negro iron-founder of Soudan. It is a curious fact that the French experts were unable to reconstruct the primitive forge of Europe. They could find no models. They were compelled to have recourse to Africa. From the earliest ages iron-forging was known among the North Africans, and the group here represented was taken from the Black Continent. The French experts, with their usual careful study, made this group a perfect representation of the inhabitants of western Soudan.

The sixth group brings us to our own continent. The Mexicans are said to have invented paper. In this group two Aztecs are engaged in its manufacture from the aloe, century plant, or agave, from which the Mexicans make their pulque. The Aztecs were copied from types furnished by the Smithsonian. The workmen were copied from original models in the Museum of Ethnography of Paris.

The committee saw fit to show in this group a picture of the present Reindeer Age as seen in Lapland; to compare it, no doubt, with the ancient. A conical tent like a Sioux lodge, with a hole in the top for the escape of smoke, a crane for smoking meat, a woman and a baby, the father returning from fishing, the son driving a reindeer sleigh and carrying a seal, all clothed in reindeer skins—these

made up the group. It was taken from a well-known family of Lapps who come from Archangel every winter, and pitch their tent on the frozen Neva at St. Petersburg. They sell reindeer skins, antlers, and carved horn, and drive the Russian children in their reindeer sleighs at twenty copecks—ten cents—a drive. The writer has often seen them on the ice, though never tempted to mount alongside of the strong-smelling Lapp. The catalogue tells us that the tent was made of canvas. We would not rashly contradict the expert who prepared it, but it was generally understood at St. Petersburg that it was made of reindeer skins, and we cannot understand how canvas could keep out the intense cold of those latitudes, ranging from 0° to —30° Fahrenheit. These Lapps had the reputation of being wonderfully weatherwise, and when they disappeared in the early dawn from the Neva, the Petersburger looked for immediate spring. They had five hundred miles of sleighing to do before they reached their homes, and it was said that they always accomplished their journey before the snow disappeared.

Passing from exhibit to exhibit in this interesting section, we come to Eastern Antiquity, to the Chaldean, Assyrian, and Persian epochs.

Recent researches, and especially those of Mr. de Sarzec, and other French explorers, have led to the general opinion that the Chaldeans preceded the Egyptians in the essential elements of civilization. These researches show that Chaldean manuscripts existed five thousand years before Christ, while other and more recent researches by other explorers show them to have existed three thousand seven hundred and fifty years before Christ. Inscriptions recently discovered, prove that at those periods civilization and the arts were highly developed. Statues, pillars, arms, tools, and instruments of many

From Persia we were carried to the far East. Curious specimens of tattooing were exhibited, mostly from Siam. This practice, coming originally from Birmah, was carried to perfection in Siam, and soon became an art. We are accustomed in the West to see tattoos on the bodies of sailors, Malays, etc., all people of the lower classes. In Siam the figures are punctured in groups on the thighs, the chests, and the backs of the upper classes. The subjects are drawn from popular legends and superstitions. They tell of the exploits of Ramah and Vichnou. They are never obscene, which in the East is remarkable. The principal figure is Hanuman, the king of the monkeys, whom certain Siam tribes look upon as their ancestor. Darwin was, therefore, a plagiarist.

The Siam artists, too, tattoo flowers and fruits and garters below the knee; and as fear plays so important a part in pagan worship, they tattoo evil spirits also, to propitiate them, as in the Eastern countries victims were sacrificed to devils. "They offered their sons and their daughters unto devils, and their land was defiled with blood." Proud are those Eastern nobles of their tattoos; they are their heraldic devices, their orders, and their decorations. They have, at all events, one great merit over European decorations of our day: they cannot be lost and they cannot be stolen.

Then followed the history of writing, beginning with picture-writing found on rocks and stones, representing animals, and lines and dots, and other geometrical figures. Then came ideagraphic writing, conveying ideas. This is better known to us as hieroglyphics, for it was almost confined to the priesthood (*hieros*, a priest). We were shown specimens of Chinese, Egyptian, Assyrian, and Hittite hieroglyphics, the last recently discovered in Syria. There were specimens of Mexican hieroglyphics, too. When Cortez landed in Mexico, the natives sent to Montezuma a painted cloth, representing the Spaniards, and their arms and ships. Written language in the earliest days appears to have been very limited. The same word represented several ideas. When spoken it was explained by the gesture accompanying it, like the Chinook of our day in use on the plains. In choice Chinook, the same word means heaven or hell, according as you point up or down.

In Egypt and in Syria, picture and idea writing soon developed into the alphabet (from *Alpha* and *Beta*, the first two letters of the Greek alphabet) somewhere about the time of Moses, one thousand five hundred years before Christ. There can be little doubt that the Hebrews knew it, and that the Ten Commandments were written in letters. In this, as in so many instances, it was the necessities of trade which led to the development of the alphabet, for we first find it in general use among the Phœnician merchants. That eminent French author, Mr. Renan, calls this transformation of picture-writing into the alphabet, "one of the greatest discoveries of human genius."

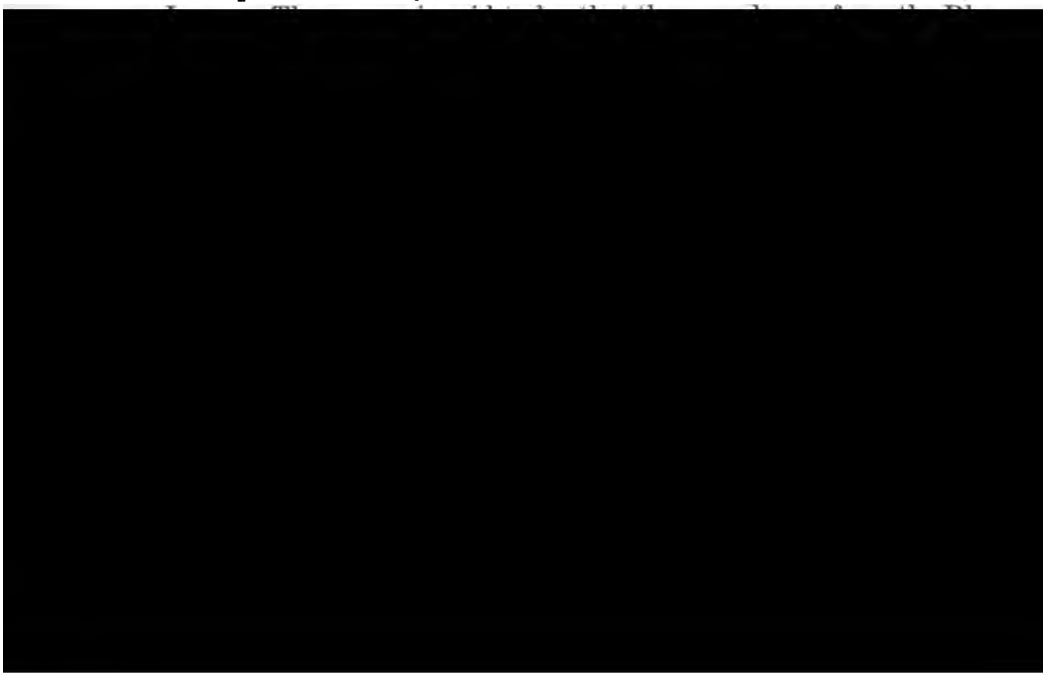
In its early stages, the alphabet consisted principally of consonants; vowels were scarcely known, and language must have been as guttural as the German of the present day. But the Greeks, with their artistic taste, introduced vowels, and as thus modified it was carried to western Europe. The Greeks too, changed the mode of writing from right to left, to left to right. In most Asiatic nations, it still remains from right to left. The Chinese write in columns.

From the history of writing, the exhibits led us somewhat suddenly to Japan.

The famous Japanese artistic work in bronze, in lacquer, and in ivory, does not date from a very early day. It began in the thirteenth century, but was not fully developed until the sixteenth and seventeenth. In this exhibit were shown many specimens of the armor of the princes and rich Daimans, iron inlaid with gold, silver, or copper, and engraved generally with dragons, but often with butterflies or flowers or fruit. The butterfly appears to have been a favorite insect with the Japanese. We all remember that pretty trick of the Japanese juggler,—keeping two butterflies in motion with his fan alone.

Japan contributed very largely to the Exposition, the Japanese Government entering very heartily into the plans of the French. In the section we are describing, there were exhibited a very large number of boxes and cabinets of lacquer incrusted with gold and ivory, and silver and bronze. But in addition to this, a considerable space in the Exposition was set apart for Japan, and was filled with a rich display of bronzes, and porcelains, silks, etc.

It is rather curious that lacquer work, of which we see such abundant specimens everywhere, should be confined almost exclusively to



SECTION II.

LIBERAL ARTS.

We come now to the second of the five grand divisions—the liberal arts.

This section began with the sciences, astronomy being the first.

ASTRONOMY.

The origin of astronomy is in astrology, which was not the vulgar empiricism it is generally supposed to have been.

The committee in charge of this subdivision had intended to have exhibited models of an ancient Chinese observatory, the oldest known to have existed; of the observatory at Alexandria, with copies of the principal instruments used by Hipparchus and Ptolemy, of the observatory of Tycho Brahe, and of that of Paris under Louis XIV. But as it too often happened, space and money failed, and the Exposition remained without these interesting monuments. It struck us that this exhibit was by no means complete, consisting principally of photographs, fragments, and some original instruments of no particular interest.

PHYSICS.

Next to astronomy came physics. The interesting history of physics, with its marvelous developments through the genius of the great men of the seventeenth century, Galileo, Descartes, Pascal, and Newton, followed by those of the eighteenth, Réaumur, Franklin, and Volta, was very poorly illustrated. The first voltaic battery, and a magnet of the Abbé Nollet, were the most striking objects.

CHEMISTRY.

The alchemists were the founders of chemistry. They labored under fearful disadvantages. They experimented with their lives in their hands. Objects of the bitter hatred of the ignorant and superstitious populace of the middle ages, and persecuted by the Church, they did their work in concealment and in danger. Persecuted in one city, they fled to another, to be driven from that in turn in a few weeks or months. The world owes more to these martyrs of science than it has any idea.

Working thus in secret, they could not make their discoveries known. They were transmitted from father to son, and from master to pupil; but they have furnished to modern chemistry materials of great value. We owe to them sulphuric acid, phosphorus, alcohol, antimony, mercury, etc. Many of these men were charlatans, living

upon the passions or the credulity of the rich; but many were philanthropists, laboring for the good of mankind.

In this exhibit there was shown the model of an alchemist's laboratory of the seventeenth century. At this date they could venture to show themselves. The experts who constructed this laboratory have carefully avoided filling it with the bats and owls, and snakes and toads, which old engravings show to have been the popular idea of the contents of a laboratory of that day.

In modern chemistry there was a very satisfactory exhibit, interesting to the chemist, but not particularly so to the layman. Furnaces, vases, glasses, porcelain, thermometers, etc., were among the objects exhibited; all proving that the experimental methods of chemistry are much the same now as in the days of the alchemists, and that the improvement has been in the apparatus alone. This has wonderfully improved, and especially in the last ten years.

GEOGRAPHY.

Ancient geography, as might have been expected, made but a poor show. The discoveries of the ancients, very remarkable for their time, were completely lost in the night of the Middle Ages. Some rough Italian and Portuguese maps, mostly of the shores of the Mediterranean, and a few later French maps, were exhibited. The Italians and Portuguese were evidently the principal navigators of those days. The English had not yet come to the front.

WRITING AND ILLUMINATION.

We come now to one of the most interesting and complete exhibits

Kings of Poland, exhibited a diploma of the election of his ancestor, Stanislas Augustus, to the throne of Poland, a work of art, though of comparatively modern times. Then there was no end of letters of the early popes, and of the kings of France from the twelfth century to a late date. The exhibit ended with oriental manuscripts from Persia, Japan, China, and Arabia, and was very charming and interesting to the layman, as well as to the bookworm. How Dominie Sampson would have reveled in it!

PRINTING.

The importance of printing cannot be overrated. It is undoubtedly the most powerful instrument of civilization ever discovered. Modern society is built upon it. As many cities dispute the birth of printing as disputed that of Homer. The French give the preference to Gutenberg, and tell us that the Mazarin Bible printed in Gutenberg immediately after the discovery of printing remains to this day the most perfect specimen of the printer's art. It has never been equaled. It contains 1,300 pages in double column, folio. It stands by itself for the clearness of the type, the quality and beauty of the impression, and the elegance of the volumes. It is not known how many copies were printed, but probably a considerable number, for twenty exist at the present day.

In the cases in this section were exhibited, first, some of the tools used in early printing, an old press called "Gutenberg," an ink table, a press for copper-plates, a German almanac of 1618, etc. Then followed some early specimens of printing, letters of indulgence, etc., of the fifteenth century. The cases were so arranged as to show the progress of printing in the different countries of Europe, Italy, Germany, France, and England, for in these four countries were published the best specimens of the printer's art.

BINDING.

From printing we naturally pass to binding. Binding is the sister art of printing, for without binding many of the most valuable manuscripts we possess would have been lost. The exhibit enabled us to follow step by step the different changes, not always improvements, in this art.

The Greeks and Romans have furnished us with bindings in the shape of screens, "libriplicatiles" the Romans called them, and Martial has described them in his Book XIV. We find this binding reproduced, strange to say, in Japan in the sixteenth century. One of the specimens exhibited was remarkable, a manuscript protected by board sides covered with a figured stuff ornamented with orchids, and at the corners dragon-flies in metal. From Constantinople came a manuscript bound in wood with an enameled plate

representing St. Andrew, while round the portrait were plates of metal with uncut stones and jewels of value and a Justinius of the fifteenth century, also in wood covered with red velvet, ornamented with carved ivory. This manuscript is protected by bands of metal repoussé, and is framed in by plates of enamel, in which are set precious stones with exquisite carving. These Byzantine bindings were made between the tenth and the fifteenth centuries, at the expense of sovereigns and prelates. They show with what art and with what splendor the artists of that day enriched their work. Carved ivory, filagree, precious stones and cameos abounded, while repoussé and chiseled silver contributed their riches to adorn valuable books.

In the thirteenth and to the sixteenth century binding was almost confined to the monasteries. Books were bound with calf and buck and pig skin, stamped with subjects drawn from the New Testament. This style was called the "monastic." When the book was of little value, the monks economized the skin. They bound only the back, and perhaps the corners. Specimens of these bindings of the fifteenth and sixteenth centuries were exhibited.

It is difficult to discover the names of the distinguished binders of the early Middle Ages. Librarians and printers looked upon binding as an inferior art, and refused to allow the name of the binder to be imprinted upon the binding. But in the sixteenth and even in the fifteenth century, many successful binders left the monasteries and wandered from city to city, pursuing their calling. Some of their names were preserved in this exhibit, but they offer very little interest except to the binder. The Elzevirs perhaps form an exception, from their connection with Molière in 1675. Two volumes were exhibited bound by them, and stamped with their trademark, an

speaks, with something approaching rapture, of a "delicious specimen of binding in mosaic, coming from the hands of the great Pasdeloup, composed of a border and a vase of flowers, and finished with the greatest perfection."

Many other exquisite specimens of printing, illuminating, and binding were exhibited, but we have mentioned enough to give an idea of this interesting section of the History of Labor. A few ancient binders' tools closed the exhibit.

AFFICHES.

Some words on the history of bill-posting, "affiches," will not be out of place in this connection. "Affiches" date from a very early period, the authorities having taken this method of communicating laws, notices, etc., to the public. Very few of the ancient "affiches" survive. The inferior quality of the paper, and the exposure to which it was subjected, would account for this. The first "affiche" we know of is now in the Jewish Museum of the Louvre. It was posted in the Temple in the reign of Herod the Great, about the time of the birth of our Saviour, and forbade all Gentiles to enter into the interior of the Temple, under pain of death. The Egyptians, too, who have taught us so much of antiquity, have given us but one ancient "affiche," a papyrus dated 146 B. C. It notifies the disappearance of two slaves, and offers a reward to whoever will give information of their whereabouts. It is not many years since such "affiches" were abundant enough in our own country. Their artistic merit was to be found in the wood-cut at the top, representing a running negro with a stick upon his shoulder, supporting his bundle.

The Greek "affiches" are well known to us. They were painted on white walls, or on tablets prepared for this purpose. Athens was burned after the battle of Salamis, and the official copy of the laws of Solon perished in the flames. The Athenians rewrote them on white planks. These planks were so arranged that by means of a simple mechanism they passed slowly before the eyes of the reader, giving him ample time to read them. Our show-shop windows have often much the same arrangement.

The Romans engraved their laws on tablets of brass. They then exposed them for a long time where the public could read them, and then preserved them in the treasury. Legal notices were painted in red or black on a white wall. They were called "albums." Any one who altered, or in any way interfered with, an "album" was severely punished. Theater bills were an important feature in Roman life. In the development we have lately given in this country to these nuisances, we are but following the Roman example, for their theater bills, too, gave the names and portraits of the principal

actors, with colored pictures representing their great parts and the most striking scenes in which they appeared. Pliny says that Callades was the most distinguished artist of his day in this line. We wonder who is our Callades! Judging from the dead-walls and board fences in Washington, we should say that he lived in that city.

In the Middle Ages the "affiche" disappeared. The crier, with his trumpet or his bell, succeeded. This was so lucrative an office that in the thirteenth century it was sold by the King to the Chamber of Commerce of Paris for a large sum. But, after three centuries, "affiches" re-appeared by an enactment of Francis I in 1539. His proclamation is still extant.

From this day, we are told, "affiches" took possession of the city of Paris, and they hold it still. At the time of the religious quarrels of the sixteenth century they drew great crowds and led to the disturbance of the public peace. Substitute "political" for "religious," and you have a picture of Paris to-day. Laws and proclamations and speeches are often posted on the dead-walls, and at a general election the most beautiful public buildings are desecrated with colored bills giving the candidates' names and their addresses to their "chers concitoyens." It is not quite so bad as our "affiches" on our picturesque mountain and river sides, but it is bad enough.

In 1771 illustrated "affiches" made their first appearance. They were not exactly works of art, and required text to explain their meaning. It was "This is a horse," "This is a cow," style of art.

Then came the revolution, when the people were too interested and too excited to give their attention to this mode of advertising. The Government, however, covered the walls with announcements of the victories or defeats of the French arms.

silver stops. To the musician and the musical amateur this exhibit was singularly interesting. It was one of the most complete in the History of Labor, both in the variety of the types exhibited and in its chronological completeness. A rebec of the twelfth century, lutes of the fourteenth, harps, violins, clarionets, of the seventeenth and eighteenth centuries; fifes, flageolets, hautboys, horns, trumpets, post-horns, drums, guitars, etc., and the tools used in their manufacture, were all exhibited; then harpsichords and pianos, with a curious collection of Middle Age and modern music, with letters of Beethoven, Mozart, etc., all accompanied by engravings of musical instruments and of musical fêtes, forming altogether a complete and admirable exhibit of the history of music.

The harpsichord played a very important part in the musical history of our ancestors. We often see old engravings of the ladies of their families seated at that instrument. The harpsichord was by no means the piano, though generally it is looked upon as the ancient form of this instrument. On touching the harpsichord, a hammer does not rise as in the piano, but a vertical piece of wood called the jack, to which is attached a tuft of crow-feathers, is set in motion. The jack does not strike, but runs along the chord, catching it, and making it vibrate. This is the principle of the spinet as well. These instruments were almost as much in demand in old times as pianos are now. The best were made by Ruckers, of Antwerp, in the seventeenth century. A virginal (a sort of harpsichord), by the same maker, was also among the exhibits. It was dated 1598. It was repaired by Chapelle in 1780. It was so good an instrument, therefore, that the owner had it fully repaired after nearly two centuries of service. We doubt if our Webers and Chickerings will stand this test.

These old harpsichords were of graceful form, and were often highly ornamented. They seemed appropriate to the florid style of music which our ancestors drew from their keys. The decorations were very varied. One made in Milan, in 1702, was covered with charming paintings of flowers and fruit. There is a great demand at present for old harpsichords. They are coming into fashion again, with other old furniture. It is thought, too, by amateurs, that the harpsichord gives to the music of the old masters a charm which the modern piano cannot give. This may well be, as the music was often written for it.

The piano was invented in Italy by one Christoferi in the eighteenth century. He conceived the idea of making the chords vibrate by means of hammers, put in motion by the keys. At first his invention made little progress; but it was soon found that a greater volume of sound was produced by the piano than by the harpsichord; whence the old name of "piano-forte."

The Conservatory of Paris had a complete set of models on exhibition, showing the different changes in the mechanism of the piano. It was made for it by Pleyel.

The invention of Christoferi, so far as manufactures and commerce are concerned, is the most important invention in the history of music. Who could have foreseen the enormous commercial transactions to which a slight change in the mechanism of the harpsichord has given rise? Two of the early pianos of Christoferi still exist in Italy, one made in 1720, the other in 1726. The oldest piano in our exhibit was made in Paris in 1770, the next in London in 1775. The English adopted the new invention much more readily than the French.

It was long before grand pianos were made in France. Sebastian Erard was the first to manufacture them. The instrument which he made for Marie Antoinette, and which was among the exhibits, is a gem of workmanship and taste.

Erard manufactured harps too, and made great improvements in them. The harp, from the time of King David and before him, until the end of the eighteenth century, remained substantially unaltered. Among the exhibits was a facsimile of an Egyptian harp, now in the Louvre, and believed to be five thousand years old. This, with a harp of the thirteenth century, shows that until the introduction of the chromatic scale by Erard, the harp remained substantially what it always had been.

THEATERS.

Although many of the plays of the great Greek and Latin dramatists have come down to us, and the ruins of their theaters have

an exact model of the theatrical machinery of the last century. A windlass below the stage made all the necessary changes. It is not long since the windlass disappeared, to be succeeded by the present complicated system of scene-shifting. The only absolute novelty in scenery and decoration, says a distinguished authority, is electricity.

The expert who prepared this exhibit thought it well to show us models of the oldest theaters of Paris. They are—

(1) L'Académie Royale de Musique, established in 1781, near the Porte St. Martin, and still there.

(2) La Comédie Française, established in 1782, and then occupying the Odéon.

(3) La Comédie Italienne, occupying the building in the rue Favart, recently burned.

(4) Les Variétés Amusantes, now simply Les Variétés, established in 1775, and occupying the building in the Palais Royal now occupied by the Comédie Française.

(5) L'Ambigue Comique, built in 1769, on the Boulevard du Temple.

Among the exhibits in this subsection were a number of play-bills of the last century, theater tickets, engravings of masks, and many portraits of distinguished actors and actresses. The Japanese contributed interesting colored engravings and photographs.

The Greeks and Romans attributed the invention of the theater to Bacchus. Theaters were often used for public assemblies, as we read in the New Testament, and as they are often used in our day.

ARCHITECTURE.

Architecture was necessarily very incomplete. Of course buildings could not be transported, and it was found that models cost too much money and would occupy too much space, while photographs were rejected as giving incomplete and frequently erroneous ideas. One valuable model, however, the committee was able to exhibit, and was indebted for it to the Metropolitan Museum of New York. This was a model of the Parthenon, prepared by Mr. Jolly, of Paris, on a large scale, 1 to 20. It gives the most minute details, and shows all the grandeur and harmony of proportion of this masterpiece of Greek architecture. With this exception, the models were confined to a few fragments. These were shown with a view to give a general idea of the best known styles of architecture.

PAINTING.

Two thousand years ago artists in Europe painted with brush and colors, and they paint with brush and colors now. No doubt, too, many thousand years ago, in the extreme East, they painted with the same instruments. It is true that the colors in our days are dissolved

in various ways, in wax, in lime-water, in glue, in egg, and in oil, but the result is pretty much the same, and the amateur, and even the artist, is often puzzled to know which process has been employed.

The committee had intended to give much prominence to the question of the material upon which paintings are made, such as walls. wood, canvas, etc. But upon reflection they considered this matter as of little consequence, for paintings are transferred from one substance to another, and without the least injury to the painting. They determined, therefore, to confine themselves to an exhibition of the different kinds of painting, and this they made very thorough.

They began with encaustic painting. This was practised by the ancients, but is lost to us. The colors were mixed in wax, and applied to the wall with heat. It is said to have been invented by Aristides three hundred and forty years before Christ.

FRESCO PAINTING.

The word "fresco" is often improperly applied. A painting on a wall is not necessarily a fresco. Fresco is a painting on a wall or other surface which has been previously prepared with a coat of lime and fine sand, and the painting been made while this coat is fresh. If it has had time to dry, the painting is called distemper.

Distemper is made with colors mixed with glue.

Tempera is made with colors dissolved in water, glue, and the white of an egg.

Aquarelles are made with colors dissolved in pure water. If gum is mixed with the water, the aquarelle becomes a gouache.

The exhibit contained specimens of all these paintings, as well as

the credit of it to Palamedes, one of the Greek heroes before Troy, and grandson of Neptune. Pliny ascribed to him, too, the invention of chess, which Herodotus gives to the Lydians. But Pliny was a devout pagan, and liked to ascribe everything that was noble and clever to the intervention of the gods, direct or indirect.

Money was minted about seven hundred years before Christ. Before its invention the daily transactions of life, as well as the great operations of commerce, were carried on by the exchange of commodities. We read of this in the sacred books, in Homer, and on the Egyptian papyrus; while in uncivilized countries articles taking the place of money have been used to a late day—cowrie shells on the coast of Africa, salt in Abyssinia, and wampum among the North American Indians.

Next came an important step towards money. Ingots of metal were exchanged for land and goods. We are told that Abraham weighed four hundred shekels of silver, and gave them for a piece of land he bought of the children of Heth. They were probably ingots, not yet marked, but "were current money with the merchant." The ingots took different shapes, as of rings in gold or silver, or of sleeping lions in bronze. Both texts and paintings attest this custom. The rings resemble the Chinese rings, which that people used for money, made of copper, and hung round the neck. The Assyrians used the bronze lion. Specimens of this money are to be seen in the Louvre.

The next ingot was round like a ball. The Siamese, till very lately, used this round money. Siamese money is now flat, but on fête days coins are inclosed in wooden balls, and thrown to the people, in memory, very likely, of the round money of their ancestors.

Finally ingots were made in the form of bars as now, and of broaches (*oboliskoi*), whence the word *obole*, the tenth part of a drachm. But the decisive step was taken when these bars, etc., were marked with their weights by the proper authorities, and so reweighing on every transfer became unnecessary.

As soon as ingots were marked in this way, there was but a step to striking coin. Its Greek name, *nomisma*, is derived from *nomus*, meaning law; in other words, it became a legal tender. From *nomisma* come *nummus* and numismatics.

The word money is derived from *moneta*, meaning something that notifies, as the stamp and the legend on the coin notify the public of its value. It is also claimed that it was so called from the first Roman mint established in the temple of Juno Moneta.

The first coins known to have been struck by the Lydians were of electrum, the "white gold" of Herodotus, composed of three parts of gold and one of silver. The Lydians obtained it from the bed of the Pactolus and from the mines of Tmolus. The early coins of

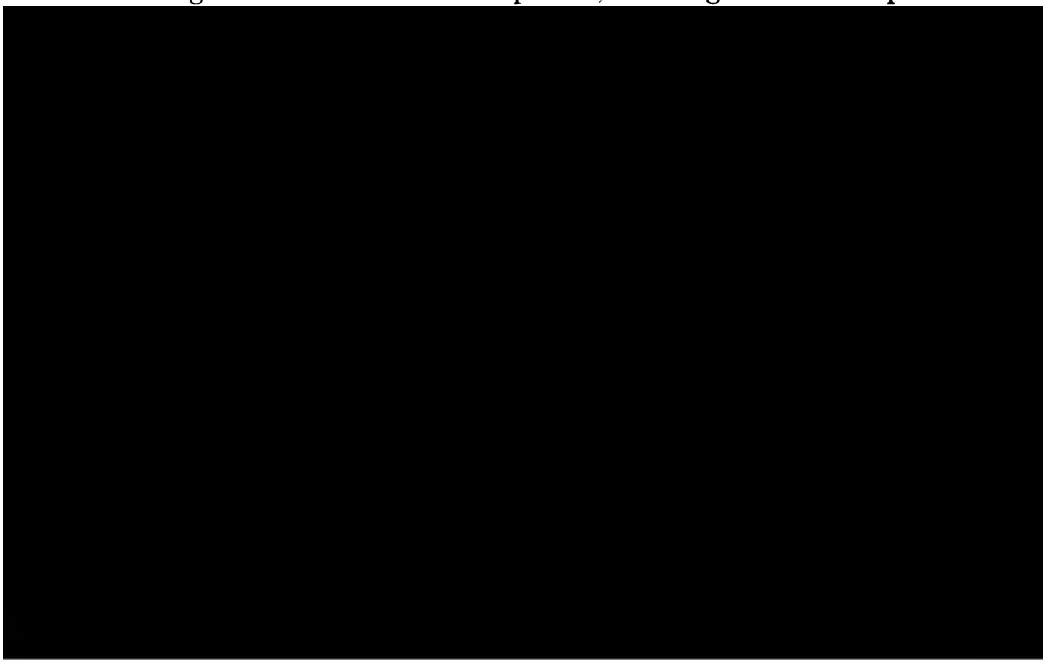
the Ægeans showed a tortoise on the face, those of the Athenians showed an owl, whence the common designation of those coins as a "tortoise" and an "owl." It is a curious coincidence that the early coins of China were called "precious tortoise," though it must not from this be supposed that the Lydians and the Ægeans copied from the Chinese. Venus had a temple on the Ægean Sea, and the tortoise was sacred to her.

It was long before the coiners gave any attention to the reverse of the coin. It was left hollow, that it might be better secured in its place by a projection on the anvil. But as the arts became perfected, coining shared the general progress. In the time of Cæsar, one Carisius struck silver denarii with both sides in relief; on the face is the head of Juno and the word "Moneta"; on the reverse are shown the different tools of coinage, anvil, pincers, and hammer, the whole surrounded by a crown of laurel.

As long as these tools alone were used in coining, the beauty of the piece depended upon the skill of the workman, for if the piece on the anvil became in the slightest degree displaced, the impression and the legend were displaced also. But in the progress of time came machinery and steam, and now very little skill is required.

The exhibit of coins ("medals" the numismatics call them) prepared by Mr. Fenardent shows chronologically, century by century, admirable specimens of this art, commencing seven centuries before Christ and coming nearly to the present day. The modern coins exposed were exclusively French.

The Romans at first had very little use for gold and silver, for their commercial transactions were not large. They used ingots of rough bronze. As the art improved, these ingots were stamped with



MEDALS.

It is only since the fifteenth century that medals, properly so called, have been struck. As we have already stated, the earliest coins were called medals, and perhaps properly so, for, having no legal circulation, they were artistic and numismatic monuments rather than money. Medals do not appeal to the popular taste. It is difficult to say why. We shall confine ourselves, therefore, to saying that Camelio in Italy in 1484 gave the first impulse to the improvement of medals, and that the art continued to flourish in Italy until the seventeenth century, when it suddenly dropped dead, and has remained dead ever since. France is now, *par excellence*, the land of medals.

ENGRAVED STONES.

Popular taste has elevated this art to a much higher plane than that of medals, perhaps from the greater difficulty of the work. We are told that it is the most difficult and fatiguing of arts. It is monotonous to a degree. Years are necessary to engrave a large stone cameo, and it is always the same work, always the knife dipped in a mixture of oil and diamond dust, diamond dust being the essential element in this art, and applied with the lathe to give the necessary velocity and heat.

Exquisitely engraved cameos of precious stones have come to us from antiquity. The Chinese and Egyptian scarabees are probably the most ancient specimens of this art. It does not appear to have been carried very far in the extreme East. The Greeks and the Romans were passionately fond of engraved stones, both in relief and in intaglio. More are found engraved in the latter than in the former manner. Many reasons are given for this. No doubt they were less liable to injury, but fashion appears to have been the principal reason, for Augustus and other emperors, and their great nobles, preferred a seal in stone to one in silver or gold.

No cameos were exhibited, except a charming little Narcissus; but plaster casts of the principal cameos in the National Library abounded, and with them a very full exhibit of the few tools used in this art and which we have named above. Cameos were generally cut in agate or onyx, these stones being better adapted to that purpose; but they were also cut in opals and emeralds.

ENGRAVING.

An admirable collection of engravings showed the progress of this art. Rembrandt alone would have ennobled the art of engraving, but by his side were Claude de Lorrain, Ruysdael, Paul Potter, and other great names. The art of engraving has been more studied in England than elsewhere. A portrait of Pius VII, engraved by Cousins,

after Sir Thomas Lawrence, is a superb specimen of the engraver's art.

In Japan engraving was practised at a very early period, perhaps in the eighth century. But it appears for a long time to have been confined to sacred subjects and principally to illustrate Buddhist books and representing Buddhist personages. As a popular art it was little known until the sixteenth century. In the seventeenth it had made great progress. It was at this date that the Japanese began to engrave in colors.

The figures in Japanese engravings are cut in cherry wood, and the colors are slightly gummed. All the mechanical part of this art in Japan is wonderful. They imitate aquarelles to perfection, and it is often difficult to distinguish between the aquarelle and the engraving.

We are indebted to Mr. Louis Gonse, the distinguished collector and expert, for the above information on Japanese engraving, and the articles exhibited fully justified his eulogium. But when in a fit of enthusiasm he comes to speak of Hokousai, the great engraver of Japan, he becomes so eloquent that we consider it advisable to confine ourselves to a literal translation:

The eighteenth century ends, and Hokousai appears. It seemed that the masters we have already named could not be surpassed, but Hokousai, the most celebrated of the Japanese artists, added to the traditions of his predecessors all the brilliancy of his fancy, of his originality, of his humor, of his profound study of life and manners, and of the universality of his genius. He crowns with fireworks the change in Japanese art. He has all the gifts. He is a rare colorist, original, admirable: his drawing is free, striking, natural—it is that of a born illustrator. He created a school of engravers first at Nagoza, afterwards at Jeddo. He filled Japan with his name and his works. The number of volumes illustrated by the hand of Hokousai

place in different ways. Sometimes the hoops were stiff; sometimes strings passed behind the head and were tied there; sometimes a hook or bar fastened them to the cap. This explains a disputed passage in Rabelais, who, in speaking of the marriage of Panurge, says: "He put on a robe of fustian, with spectacles hanging to his cap."

SECTION III.

ARTS AND TRADES.

Our third Grand Division treats of Arts and Trades (*Arts et Métiers*); "crafts" would perhaps be a better translation. This is a vast subject. It was divided into four principal heads and subdivided indefinitely.

First, man with his tools; second, animals with wheels and sleighs; third, sails, windmills, pumps, etc.; fourth, water, with water-wheels and other applications of water power.

(1) The search for and the collection of raw material; (2) hunting and fishing, with snares, traps, and arms; sponge fishing, coral fishing; (3) mining, the extraction of minerals; (4) the cultivation of the earth, horticulture, arboriculture, viticulture, the gatherings of the fruits of the earth, forestry, agricultural implements, etc.

PREPARATION OF RAW MATERIAL.

Wood.—(1) Building wood with the necessary tools; (2) wood for furniture, natural and artificial, tools, carving, musical instruments, etc.

Stones, natural and artificial.—(1) Natural: The material, the tools, cutting, carving, stone for building. (2) Artificial: Material, tools, concrete, cement, etc. Burned stone: Material, tools, lime, cements, processes for hardening stone, stucco, etc. Mosaic, baked clay, pottery and glass. Material, tools, processes for the manufacture of brick, tiles, pipes, etc., pottery of all kinds. (3) Glass and crystal: Material, tools, goblets, wine-glasses, imitation pearls, mirrors, chandeliers, etc. (4) Enamel: Material and tools, engraved, enameled lava and metal. (5) Mosaics in glass and in enamel: Material and tools.

Metals.—(1) Material and tools for the many primary processes to which metals are subjected. (2) Final finish: Material and tools, gold and silverware, hardware, etc., machines and tools for watchmaking, etc. (3) The working and engraving of metals, gilding, covering, nickeling, and tinning.

Textiles.—Wool, silk, cotton, hemp, flax materials and tools, spinning, rope-making, washing, dyeing, printing, etc.

Paper.—Material and tools for making coarse paper, for making fine paper, decorated, printed and colored.

Skins, etc.—Material and tools for the preparation of skins, furs, hair, feathers, horn, whalebone, ivory, tortoise-shell, cat-gut, etc.

ARTS AND CRAFTS NECESSARY TO MAN'S LIFE, WHETHER LIVING ALONE OR WITH OTHERS.

Clothing.—Material and tools, artistic garments, shoes, gloves, and hats, with infinite subdivisions. Preservation of clothing, washing, ironing, cleaning. Adorning the person, hygiene, toilet, coiffure, etc.

Building.—Material and tools, grading, masonry, carpentry, etc.; houses, temporary, portable, permanent.

Warming.—Material and tools, etc.

Lighting.—Different methods, individual (lamp), or collective (gas, etc.).

Cooking.—Kitchen apparatus, furnaces, kitchen utensils, etc.

And for man living in communities—ventilation, reservoirs, aqueducts, sewers, hygiene, posts, and telegraph.

With a Grand Division so vast, we must select the most important subjects only, and say but a word upon each of them; remarking generally that the exhibits were most full and satisfactory, thoroughly illustrating the subjects under consideration.

AGRICULTURE.

Agriculture was represented by pictures, and by ancient and modern implements. Among the exhibits was a reaping-machine used by the Gauls, and described by the elder Pliny, with modern ma-

In 1480 the arquebus was invented. It was touched off by hand. The matchlock was invented at the beginning of the sixteenth century, and an ordinance of Francis I. in 1515, mentions hackbuts also as instruments of the chase. At the end of the sixteenth century, when the arquebus had been so much improved that it could be used for wing shooting, the cross-bow disappeared.

The wheel-lock was invented at Nuremberg in 1520, and flint-locks about a hundred years later.

At the beginning of the present century a fulminate was invented to ignite the powder, and get rid of the flint and the flashing of the powder in the pan. It was about the size and the shape of a homeopathic pill, and was composed of wax and chlorate of potassa. In 1810 the cap was invented, made of copper and filled with fulminate of mercury. In 1812 Pawly invented a breech-loader, the commencement of the many systems now in use. Among the exhibits was a breech-loader signed de Dupont, and dated 1771.

Hunting in the beginning was undoubtedly for food and clothing alone; but in the progress of time men began to hunt for amusement. It was then that the heads and skins and horns of the game were carefully preserved, and hung upon the walls of castles and chateaux. Some magnificent specimens of the trophies of the chase, mounted by Deyrolle, were exhibited.

HAWKING.

Many spirited engravings of hawking parties are extant, for it was a sport beloved of our ancestresses.

There is a general impression that this sport has fallen into total disuse, but this is an error. In Africa, in the East, and especially in Japan, it still holds a prominent place among the sports of the field. In France and in Ireland, but especially in England and near Leeds, it is still practised. The hosts of the chateaux think, with truth, that it adds attraction to a country life. The exhibits were interesting, consisting principally of hoods, jets, gloves, horns, and engravings, among them some well-known ones. The Japan exhibit was various, among other things pigeon whistles, which were fastened to the tail of the pigeon to keep off birds of prey as he flew. An excellent exhibit was made by the English. One by Gerard Lascelles, master of "The Old Hawking Club of Leeds," gave a photograph of a picture by Howe showing a group of hawkers, and among them the well-known John Anderson, chief falconer to the club. Another photograph showed the same Anderson in the livery of the Duke of Athol. It appears that on the coronation of George IV in 1821, Anderson presented two falcons to the king, such being the tenure upon which the Dukes of Athol held the Isle of Man as tenants of the Crown.

FISHING.

The subject of fishing was very lightly touched upon. The processes, nets and hooks, were formerly as now. The difference is in their manufacture. Hooks, originally of bone, of shell, or of wood, have given place to those of the finest steel. Rods are now made by machines, and not by hand. They are made of split bamboo, and even of steel. The committee who arranged this section were not well posted on whale fishing. They seemed to think that whale fishing is now confined to the Norwegians. They were not aware, apparently, that New Bedford and San Francisco still send out whaling ships, and that Dundee and a few towns in the north of Scotland send out more tons of whalers than the whole Kingdom of Norway. These gentlemen also refer to a canoe in the exhibit as "un canot en cuir de la tribu de la Protowance, usité sur la rivière de la Fièvre près de Mary Fall dans le Mississippi," which probably means "a leather canoe of the Pottawatomies, used on Fever River, near St. Mary's Falls, on the Mississippi." The "Protowances," as our committee calls them, are nearly extinct. They were a part of the Algonquins, and are now cared for by Quakers in Kansas. The "Friends" have done much for the welfare of the red men.

Under the head of Food many pieces of old "batteries de cuisine," especially of the eighteenth century, were exhibited. Under the head of Lighting, all sorts of lamps, ancient and modern, with machines for making candles.

Under the head of *wood* were exhibited specimens of the finest woods, and of the tools with which they were wrought. The wedge was the very earliest instrument used for working in wood; then

years. In 1876 another attempt was made to establish a factory in Paris. In addition to these, the Venetians have for a long time been at work on mosaics. This exhibit was not large, as it is difficult and destructive to remove mosaics. The tools used in the different processes have scarcely varied since the earliest days.

CERAMICS.

Very little information was given us in this important section, but the exhibits were abundant and curious, including the crudest of pottery and the finest of Sèvres. The products of Japan, too, played an important part. Our friend Mr. Gonse is almost as enthusiastic about Japanese pottery as he is about Japanese engraving. He says:

> Remark the originality of the shapes, their robust, elegant, and supple grace. Remark the logic of the ornamentation, drawn from the character and purpose of the vessel. No ceramic in the world offers a finer and more lasting paste, more fit to receive those florid, rich, and translucent colors, which overflow on the sides of the vessels in sheets, in brooklets, in drops, like a generous sap, and rival stone in brilliancy.

Mr. Gonse exhibited a valuable collection of Japanese pottery and porcelain.

GLASS.

Glass is of much more modern date than porcelain, though glass beads have been found in Egyptian tombs. Glass was probably accidentally discovered in the process of making porcelain. The Romans used it for domestic purposes to hold perfumes, and in their religious ceremonies too. It was used in very limited quantities for windows in the mild climate of Italy. The East was very successful in the manufacture of glass. Later Venice entered the lists, and Venetian glass is famous to-day. Bohemia, too, produces beautiful glass. French glass attained its present perfection in the eighteenth century.

The exhibit showed a number of specimens of Swiss glass, which were divided into two classes. (1) White, painted or enameled, and (2) colored or opal. The latter, which is highly valued, owes its origin to Venice, Italian workmen having introduced it into Switzerland. The French call it "verre de lait," and the Germans "milchglas." One of the pieces exhibited was ornamented with a bird, with the inscription "When this bird sings, my love will cease." Making love in glass strikes us as something new in that line. It is curious what a demand there is for milk color in glass, in silver, in pewter, and in stones.

STUFFS.

Stuffs, silks, etc., were exposed in the adjoining cases; some of the time of the First Empire were very rich and beautiful. And

here our friend Mr. Gonse comes to the fore again and goes into raptures over Japanese silks and velvets, of which some few were exhibited.

In the seventeenth century costume attained its apotheosis of dignity and splendor; the processes of weaving had made all their progress. This is the epoch of thick figured silks, brilliant and masculine, and of those Terry (ribbed) velvets, which have the softness and harmony of old tapestry. Then the eighteenth century sowed upon this soil its feminine graces. Taste, richness, refinement, are carried to their acme, and [here come the fireworks again] it is a blinding *feu d'artifice.*

RIBBONS, TAPESTRY, PRINTED PAPER.

We did not find these exhibits very interesting. As curiosities, there was a sewing-machine constructed in 1830, and several specimens of old Flemish tapestry of the sixteenth century, when this industry appears to have attained great perfection in Flanders. One of these tapestries represents two subjects, "David and Saul," with the javelin in Saul's hand, and "Tobit before his Father." It seems to have been a practice of the Flemish artist to represent these two subjects together. It would be interesting to learn the reason. The writer has in his possession a pair of old Flemish silver plates, representing the same subjects.

We were disappointed not to find in this exhibit some of those beautiful carpets and rugs which were shown in the Exposition of 1878, and especially in the Indian Court. The decision of the British Government to take no official part in the Exposition of 1889 was, no doubt, the cause of the poor display made in the Indian building and in the History of Labor.

Carpets, we are told, originated as embroidery, and were first used as hangings. They are noticed in this connection in the Pentateuch

Carpet manufacture was early introduced into France, and carried thence by the St. Bartholomew refugees to Switzerland and elsewhere. We noticed in this exhibit only one carpet, a "sarracinois," and two or three of gilt leather. In the Persian section there was a display of rugs and carpets, but it was shrewdly suspected that they were mostly manufactured at Kidderminster.

MECHANICS.

The object of this exhibit was a modest one, and well it might be, for the subject is too vast. The committee wished simply to show by the exhibits the different progressive steps of this great science, which has so modified the conditions of life in modern society. Levers, pulleys, water-wheels, sails, etc., were invented at a very early date, but the theoretic study of these engines, with a view to their improvement and development, has begun but lately.

Among the most interesting exhibits were those connected with the raising of water, one of the first needs of civilized man—windmills, pumps, chain-pumps invented by the Arabs, Archimedes screw, and the ram. After these earlier inventions came hydraulic machines to utilize the power of running water, water-wheels, including turbines, etc.

As wood became scarce, it became necessary to use coal, and the ingenuity of inventors was turned to the means of keeping mines free from water. Water columns and steam-pumps came into use. The French engineer who had charge of this department seemed to think that with these inventions the problem had been solved; he did not seem to be aware that at great depths and with the water very hot, the steam-pump is not enough. In California and Utah our miners have been compelled to tunnel the sides of the mountains, striking the mine at a very great depth, and so drawing off the water. The Sutro tunnel is a notable example of this.

This exhibit was interesting, but was necessarily very imperfect. Nothing was shown of electricity, the most wonderful discovery perhaps of any day.

MINES AND METALLURGY.

These offered interest, no doubt, to miners and metallurgists, but very little to the general reader. The exhibit, too, was very imperfect.

CUTLERY.

This art appears to have reached its apogee in France in the eighteenth century. Since that date the necessity for cheapness, and the use of machinery, have led to a falling off in workmanship. The cutler of the eighteenth century made the whole instrument himself. If the handle was to be ornamented with precious metals, he prepared and

chiseled them. The forge and the file were in that day the only tools of the cutler.

The exhibit was exceedingly interesting, consisting principally of knives and forks, scissors, razors, and surgical instruments. A small knife was exhibited which had belonged to Marie Antoinette; the blade and handle are both encrusted with gold and mother-of-pearl. The knife was without spring. Happily it was under repair when the Queen was arrested. A number of treatises on cutlery, ancient and modern, were also exhibited.

Tin at one time played an important part in the history of art. In the sixteenth century articles of considerable beauty were made in tin, especially in Nuremberg. A tin basin was exhibited made in France, elaborate and in very good taste. The tin plates made in Nuremberg in the seventeenth century, and generally stamped with religious subjects, were much coarser. Tin, for art purposes, if it can be so called, is now used principally for children's toys.

GOLDSMITH, JEWELER, WATCHMAKER.

The exhibits under these heads were full and admirable. Workshops of these different arts were reproduced, all of the eighteenth century, when these trades were carried to their highest excellence in France. Our attention was called to the fact that, while the tools generally remain the same, the use of gas furnaces, and the introduction of the lathe in place of the hammer, have revolutionized the manufacture.

TELEGRAPHY.

France, of course, claims the telegraph. An aerial telegraph in-

TELEPHONE.

In 1876 the telephone was invented in the United States by Bell. Every year sees improvements in this instrument. Our countrymen can now converse between Portland and Buffalo, 750 miles. Edison is reported to have said that the telephone cannot be carried for any distance under water, and that we must therefore give up all idea of conversing with our friends in Europe. But on land the development is enormous. There are 170,000 miles of telephone wire in the United States, and 1,055,000 conversations are carried on over them daily. There are more than 300,000 telephones in use.

Telephones are much used in Switzerland. People talk with ease between Geneva and Vevey, Basle and Zurich, etc. You engage your room now at your hotel by telephone and not by letter, thus settling all the details at once without the trouble of a long correspondence.

SECTION IV.

TRANSPORTATION.

One of the causes of the great success of the Exposition of 1889 was undoubtedly to be found in the knowledge and skill of the experts in charge of it. Take, for instance, the section now under consideration. Its bureau consisted of Mr. Alfred Picard, inspector-general of roads and buildings; Mr. Maurice Bixio, president of the council of administration of the "Compagnie Générale des Voitures, à Paris," and Mr. Henry Perèire, superintendent of the railroads of the south. To these and others were added many eminent English engineers, representing the railroads, steamships, ship canals, etc., of Great Britain. With such a board, it may well be supposed that this grand division of "Means of Transportation" was thoroughly illustrated.

Transportation is one of the first needs of man. Without it we could not collect raw material, exchange products, or provide means of subsistence.

We begin with the individual animal. He transports himself, the food he needs, or the articles he wishes to barter. A type of the first means of transportation is to be found even in our day in the heart of Africa, where the naked negro marches day after day carrying one or two tusks of ivory on his head.

The subject naturally divides itself into two heads, the road and the carrier. Both of these were amply illustrated, from the scarcely traced path through the forest to the modern railroad, from man to the improved locomotive and the magnificent transatlantic steamer.

The history of road transportation was divided into four parts, land roads, river and sea roads, railroads, and air roads. On the land it commenced with the natural path, and then passed to the path transformed into *the road. It included* the methods of crossing hills

and water-courses, and led to the history of embankments, drains, bridges, and tunnels.

On the water it included the methods employed to improve river navigation by dikes and locks, canals, too, with towage. On the sea it included the compass, charts, buoys, lighthouses, and natural and artificial roadsteads, ports, etc.

The history of the railroad included the study of the different forms of substructure and superstructure, signals and telegraphic apparatus. The first carrier being man, with him in this capacity were exhibited shoes, staffs, poles, cords, rollers, the animals he pressed into his service, and rolling or sliding vehicles.

The history of water transportation began with a tree trunk, the raft, the canoe, the sail-boat, and finally reached the steamer. To supply the power needed for transportation the exhibit began with man, then oars, sails, animals for towing, steam, compressed air, and electricity.

The history of sea roads included all kinds of ships, and the changes in their construction from the earliest dates.

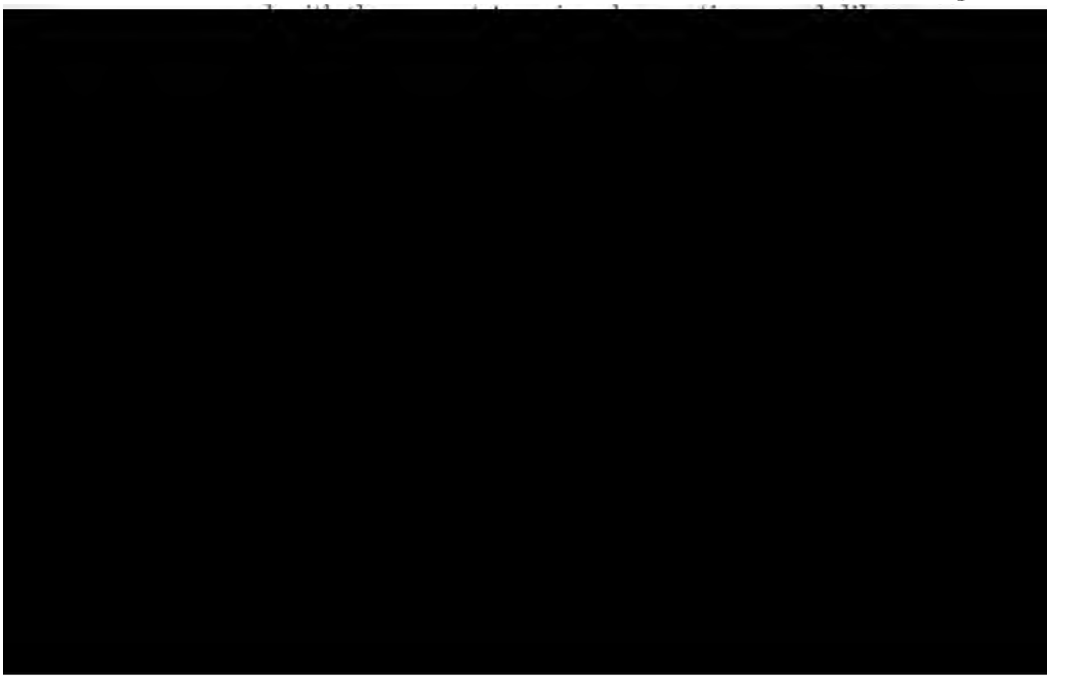
The history of railroads was shown on the one hand by stationary engines contrasted with modern locomotives, and on the other by open passenger cars contrasted with the vestibule train.

Ballooning was shown in the hot-air balloon and in the gas balloon, directed by steam or dynamo-electro machines.

The reader can easily judge how large, complete, and interesting this exhibit must have been.

A rapid mention of some of the principal objects is permissible.

The locomotives constructed by Stevenson, one in 1825 and the other, called the "Rocket," in 1829, very small and rough-looking as



the *Great Britain*, which ran between Liverpool and New York in 1841; photographs of remarkable bridges, viaducts, etc., in France, England, and the United States; and among others that of the Brooklyn Bridge, of the Poughkeepsie Bridge, St. Louis Bridge, and several others; and an old English railway ticket in bronze, 1832. As regards canals, and everything connected with them, and railways, including the road, the locomotives, and the cars, the English exhibit was the most perfect, including specimens of the toothed rail and wheel, made at a time when their engineers assumed, without experiment, that the adhesion of the wheels to the rail, through the weight of the locomotive, would not be sufficient to move the train.

SECTION V.

MILITARY ARTS.

The last Grand Division of the History of Labor is the Military Arts. Captain Lyle, U. S. Army, of the Ordnance Department and aid-de-camp to the Commissioner-General, will make a report upon this subject. We confine ourselves, therefore, to a few words upon its history.

There has existed for some time at the Louvre a most complete exhibit of the navies of the world from the most remote times to the present, the best probably in Europe. It was not thought worth while to transfer this collection to the Champ de Mars, and one exhibit showed, therefore, the history of land forces only. It was divided into twelve chapters. In the first were portraits and pictures, commencing with the Gaul fighting in his chariot, and coming to the present day; arms, uniforms, etc., belonging to the distinguished generals of France, were exhibited. Then followed the history of arms and of uniforms. Chapter II showed the arms of the Middle Ages. Chapters III and IV were devoted to the history of infantry and cavalry, with a display of old battle-flags, dear to the patriotic Frenchman. Chapters V and VI were devoted to the scientific branches of the service, artillery, engineering, etc. Chapter VII to the geographical service. Chapter VIII to military histories and treatises. Chapter IX to the Belgian Army. Chapter X to the armies of the East and the Far East. Chapter XI to the history of farriery, and Chapter XII to that of fencing. These subjects will be fully and completely treated by Captain Lyle. We propose, however, to say a few words upon farriery, as a subject of general interest, and not exclusively military.

FARRIERY.

The domestication of the horse antedates our era some five or six thousand years. He came from Central Asia, and entered Europe in the successive invasions of the barbarians. As long as he re-

mained in Central Asia, he needed no protection to his foot; but as soon as he began his long journeys to the westward, whether it was owing to longer marches, or to the change in the climate and soil, his hoofs began to give out. The ancient historians tell us of long delays in the march of armies, needed to allow the horses' hoofs to grow out, and Xenophon, Cato, Varro, and other commanding officers, were compelled to issue general orders for the proper care of the horses' hoofs.

The first horseshoe was of leather, and was intended for the cure rather than for the preservation of the hoof—a sort of boot-leg and shoe plaited in straw, and still in use in Japan. They were used by the Romans, and called hippo-sandals. As regards the iron horseshoe fastened by nails, of the present day, some authors think that, though not known to the ancient Romans, it was known to the Germans and Gauls; but the better authority puts this invention four or five centuries after the birth of our Saviour. These shoes certainly existed as early as that date, for the writer has seen them in the Museum of Hombourg-les-Bains. They were dug up in the old Roman camp in the neighborhood of that town. This camp was taken and destroyed by the Germans about the date mentioned. It remained undisturbed for centuries, and it is not long since the antiquarians of Frankfort and the neighborhood began their researches in the ruins. They have been amply repaid by the discovery of articles of bronze, of wood, and of iron, showing not only the Roman domestic life of that day, but also the entire arrangement of a large Roman camp intended to hold a garrison of half a legion, or five thousand men. Horseshoe nails, bits, and stirrups, all of our present forms, were also found there; the nails were shaped like a T.

RETROSPECTIVE EXPOSITION OF LABOR AND ANTHROPOLOGY.

GENERAL REGULATIONS.

ARTICLE 1. The Retrospective Exposition of Labor and of the Anthropological Sciences shall be international. The general regulations agreed upon by the Superior Commission on Organization appointed by Article 3 of the ministerial decree of October 12, 1887, and approved by the Minister of Commerce and Industry, shall be sent to all the departmental committees of France and to all the foreign national committees.

ART. 2. This Exposition shall be held in the grand nave of the Palace of Liberal Arts on the Champ de Mars.

The administration undertakes the expense of the construction and decoration of the premises necessary for this Exposition.

The administration may also undertake the expense of the installation and transportation of certain articles loaned to the Exposition.

ART. 3. The administration shall take all proper precautions to guard the articles exhibited against theft and accidents of all kinds; but it cannot be held responsible under any circumstances.

ART. 4. The contractor for the General Catalogue shall be required, in accordance with Article 3 of the Schedule of Charges, to publish a special descriptive catalogue of the Retrospective History of Labor and of the Anthropological Sciences.

ART. 5. The articles composing the Retrospective Exposition of Labor and of the Anthropological Sciences shall be divided into distinct groups corresponding to the five sections indicated by Article 1 of the ministerial decree of October 12, 1887, *i. e.*:

Section I. Anthropological and Ethnographical Sciences.
Section II. Liberal Arts.
Section III. Arts and Trades.
Section IV. Transportation.
Section V. Military Arts.

ART. 6. Each committee appointed conformably to Article 2 of the ministerial decree of October 12, 1887, shall be charged with the organization of the section for which it was appointed conjointly with the Director-General of Management.

ART. 7. The Retrospective Exposition of Labor and of the Anthropological Sciences, especially in so far as Sections II, III, and IV are concerned, shall include the processes of intellectual labor at different eras of the world; ancient apparatus of scientific research and of practical industry; professional or common apparatus, machines and means of transportations; old mechanical instruments and old tools of trades, represented by the originals, by restored models, by plastic representations, sketched or photographed by designs taken from monuments, by sigillography, by numismatics, etc.

Raw material and manufactured products, artistic or commercial, can be exhibited only as samples or as characteristic types, conjointly with the apparatus, machines, or tools which have been used for the collection, extraction, or preparation of the raw material, or for the technical execution of the manufactured article.

ART. 8. The Retrospective Exposition of Labor should, as a general rule, contain only the apparatus, the machines, and the tools no longer in use, or which are only used in an improved form.

ART. 9. No article exhibited shall be copied, drawn, or reproduced under any form whatever, without the permission of the proprietor or of the exhibitor, approved by the Director-General of Management.

ART. 10. The general programme of the Retrospective Exposition of Labor and of the Anthropological Sciences is briefly as follows:

SECTION I.—ANTHROPOLOGY, ETHNOGRAPHY.

1. *Anthropology.*

Casting and working of metals, copper, bronze, iron. Specimens of molds and of articles in melted or wrought metal. Founders' stamps, etc.

Derivation of glass, enamel, etc. Specimens for comparison borrowed from living savage tribes; means of obtaining fire, of working in stone, in bone, in wood, in clay, etc. Metallurgy compared.

3. *Archæology.*

Articles relating to the history of labor in antiquity; Egypt, Assyria, Phœnicia, Greece, the Roman Empire (especially Gaul), the Far East, the New World.

Reduced models, plans, etc., of typical constructions—sculptures and paintings (originals or copies), reproducing the manual occupations; scientific apparatus and material of the industrial arts (as far as the reign of Charlemagne); specimens representing different phases of manufacture; collections of typical manufactured products.

SECTION II.—LIBERAL ARTS

1. *Sciences.*

Astronomy, instruments, zodiacs, sun-dials, gnomons, water-clocks, astrolobes, armillaries, celestial globes, telescopes, quadrants, astronomical literature. Reconstruction of models of observatories, Chinese, Hindoo, Egyptian, of Ulugh-beg, of Uranenburg, first observatory of Paris, second observatory of Paris.

Geodesy.—Instruments and apparatus of geodesic stations.

Meteorology.—Instruments and apparatus of meteorological stations.

Physics.—Instruments.

Chemistry.—Instruments. Reconstruction of models. Alchemist's laboratory. Chemist's laboratory. Cabinet of physics, surgery, and physiology. Instruments.

2. *Manuscripts*

Printing, books, newspapers, manuscripts. Tools employed, material employed, specimens of tablets, of papyrus, of parchments, etc.

Printing.—Letters, presses.

Books.—Specimens of paper, binding tools, specimens of books (printing, binding, and size and shape).

Newspapers and hand-bills.—Specimens of newspapers and hand-bills, plain or illustrated; special presses for newspapers, reconstruction of models, a printing office, a book-store of the sixteenth century.

3. *Instruction.*

Specimens of articles and furniture used in teaching, according to the age and country; reconstruction of models; classes and libraries.

4. *Music and theatre.*

Music.—Instruments of music; musical works in relation to their execution; manuscripts; types of scores; partitions and orchestral parts.

Theatre.—The salle, views and plans; decoration, designs, machines, lighting, costume, masks; theatre bills, journals, programmes, tickets, collection of models.

5. *Arts of design.*

Architecture.—Illustrated documents and models representing the different styles of building. Typical reproductions of architecture, according to styles and periods since Charlemagne.

Painting.—Illustrated documents representing a painter's studio; types of the different models of painting; antique painting; mosaic; illumination of manuscripts; frescoes; painting in oil, in wax; artistic painting on glass and on metals, etc.

Sculpture.—Illustrated documents representing workshops; specimens of artistic sculpture in stone, in marble, in parti-colored marble, in bronze, in other metals, wood, clay, etc.; use of clay, wax, and plaster; specimens of artistic castings in sand and in wax.

Artistic medals and precious stones.—A series of special tools for the different processes of stamping and of engraving; specimens of the results obtained with these tools.

Engraving.—A series of plates and tools. Specimens of the results obtained by the different processes.

Lithography and chromo-lithography.—Plates, tools, presses, specimens of the results obtained by the different processes.

2. *Arts and trades for the collection and extraction of raw material.*

SEARCH FOR RAW MATERIAL.

(1) *Hunting and fishing.*—Material and tools; snares, traps, arms; auxiliary animals; methods of hunting and of fishing, both river and sea; preserves, fish-ponds, etc. Sponge fishing. Coral fishing.

EXTRACTION AND PREPARATION OF MINERALS.

(1) *Search for minerals.*—The magic ring, the compass, boring.

(2) *Extraction of minerals and of mineral matter other than metals.*—Gaseous, solid, and liquid products; metals; mineral matter (salt, sulphur, petroleum); chemical products; ores used, material, tools, processes.

COLLECTION AND PREPARATION OF RAW MATERIAL NOT MINERAL.

Processes for the cultivation of the soil; horticulture, arboriculture, viticulture; picking and gathering the products of the soil; forestry; tools and agricultural implements for the preparation of raw material.

3. *Arts and trades for the working and transportation of raw material.*

ALIMENTARY MATERIALS.

Preservation of food, milk, meat, fish; processes for the preparation of agricultural products; manufacture of alimentary matter, of vegetable or animal origin.

WOOD.

(1) *Building woods.*—(*a*) Natural wood: Material and tools for the preparatory work in wood. (*b*) Painted wood: Coloring matter employed; material and tools.

(2) *Wood for furniture.*—Natural woods, prepared woods: Material, tools, processes for artistic carpentry, sculpture in wood, cabinet making, veneering, toy-making, basket-making; manufacture of musical instruments.

NATURAL AND ARTIFICIAL STONE.

(1) *Natural stone.* Material, tools, processes for sawing, cutting, and carving selected stones; stone for ornament and for building.

(2) *Artificial stone.*—(*a*) Unbaked stone: Material, tools, process for the manufacture of concrete, plaster and cements. (*b*) Burned stone: Material, tools, and processes for the manufacture of lime and cements. (*c*) Stone variously prepared: Processes for hardening stone, stucco, etc. (*d*) Grouped stones; mosaics.

BAKED CLAYS, CERAMICS, AND GLASS.

(1) *Baked clays for trade.*—Material, tools, processes for the manufacture of brick, paving brick, tiles, pipes.

(2) *Ceramics of different clays, stoneware, crockery, porcelain.*—Material, tools, brick, paving brick and tile decorated or enameled; pottery of all kinds; table and toilette services, decorative pieces.

(3) *Glass and crystal.*—Material and tools for manufacturing, decorating, cutting, and engraving; goblets, wine-glasses, spun-glass, pearls, imitations of precious stones, mirrors, chandeliers, window-panes.

(4) *Enamel and enameling.*—Material and tools for the manufacture of enamels engraved and cloisonnés; enameled lava; enameled castings.

(5) *Mosaics in glass and enamel.*—Material and tools for the manufacture of mosaics in glass and enamel.

METALS.

(1) *Preliminary work.*—Material and tools for raising, preparing, cleaning, drawing, piercing, and stamping.

(2) *Finishing.*—Material and tools; (*a*) for work in fine metals; goldsmith's work in all metals; jewelry, real or imitation; (*b*) work in cast metals; cast-iron decorative or industrial, locks, sporting arms, brass work, tin, hardware, ornaments, cast or stamped for the decoration of buildings, bronzes for furniture. Machinery and tools for the manufacture of clocks and instruments of precision; clocks and watches.

(3) *Arts and trades akin to work in metals.*—Trade moldings; plain castings in wax, hollow; electro-plating; decoration of metals

4. *Arts and trades necessary to individual life and to life in communities.*

CLOTHING.

Material and tools for the manufacture of costumes; linen **garments**, shoes, gloves, hats; civil costume, military, ecclesiastical. **Care** of clothes; washing, scouring, ironing, blacking. Care and **ornamentation** of the person; hygiene, toilette, hair-dressing, etc.

BUILDING.

Tools and material; grading, masonry, scaffolding, roofing, carpentry, locks, painting, and glazing; temporary, portable, and permanent habitations.

HEATING.

Tools and materials, heating, buildings.

LIGHTING.

Lighting by independent or by distributing apparatus.

PREPARATIONS OF FOOD.

Apparatus employed in the kitchen, furnaces, turn-spits, cooking utensils.

INTERVENTION OF THE ART OF THE ENGINEER FOR THE SATISFACTION OF THE WANTS OF MAN LIVING IN COMMUNITIES.

Ventilation of workshops, of habitations; feeding cities, reservoirs, aqueducts; removal of refuse; canalization, sewers; hygiene; posts and telegraphs.

SECTION IV.—TRANSPORTATION.

1. *Transportation by land.*

The road.—All that represents the transformation of the way serving for transportation, from the natural path to the perfected road, comprising consequently every species of road, as well as bridges, viaducts, tunnels, etc., from the beginning of the world.

The carrier.—All that represents transportation by man, with or without machines; transportation by hand, or on the backs of man or of animals; transportation by vehicles drawn by man or animals.

2. *Transportation by river or sea.*

Means employed to utilize navigable water courses; canals; maritime ports. Lighting and buoying the coasts; boats employed on water-courses and at sea.

3. *Transportation by railway.*

The road; signals and safety apparatus. Motors, rolling stock, accessory plant.

4. *Transportation in the air.*

Balloons, cars, and rigging; processes of ballooning; special instruments.

SECTION V.—MILITARY ARTS.

1. *Miscellaneous.*

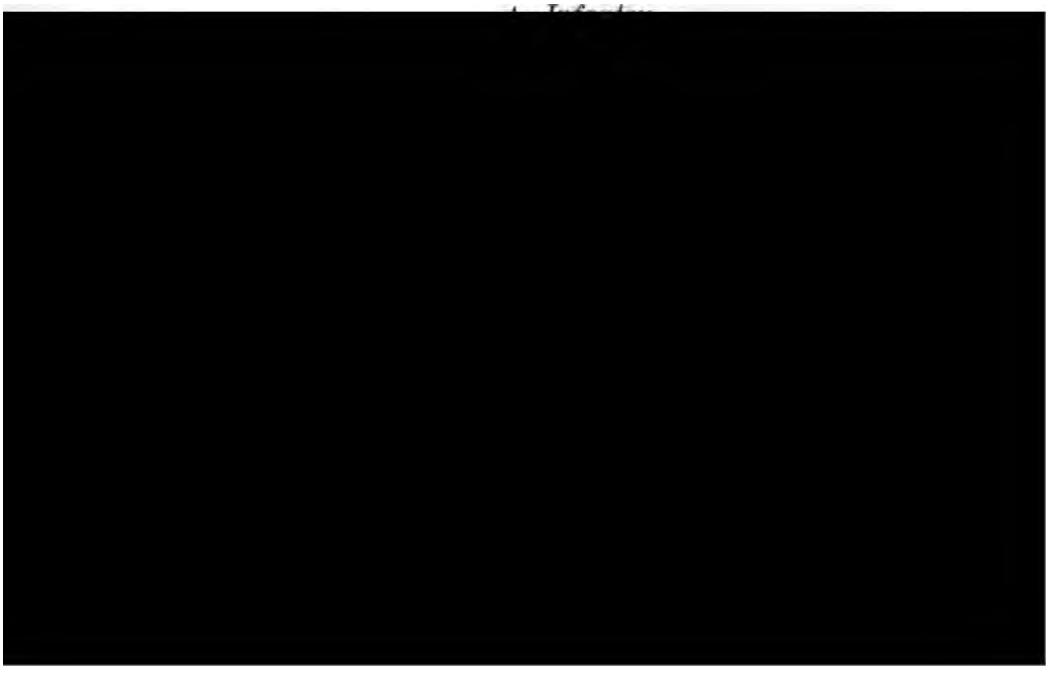
Historical articles; articles having belonged to warriors or to historic personages; divers arms, historical, artistic, or curious, prior to the eighteenth century; standards and flags prior to the eighteenth century; portraits of distinguished warriors.

2. *Artillery.*

Articles of ornament and of equipment; reproduction of paintings, engravings, and designs of costumes, and of scenes relating to arms; reduced models of machines of war, of guns and carriages; models of bridges, of boats, and of trestles; pictures and portraits.

3. *Engineering.*

Models of the attack and defense of fortified places. Plans in relief; models of sapping and mining works; series of tools, pictures, and portraits; illustrated history of the uniform of this army.



7. *Staff.*

Portraits; series of uniforms of general officers and of the staff; series of apparatus of the military sciences; castrametation, topography, plans, maps, works of strategy and of tactics; general bibliography (the bibliography relating to each arm will be found in the section to which the arm belongs).

The present regulations were adopted by the Superior Commission on the organization of the Retrospective Exposition of Labor and of the Anthropological Sciences, March 29, 1888.

G. BERGER,
Director-General of Management.

Paris, March 30, 1888.

THE RIGGS COLLECTION OF ANCIENT ARMOR.

PARIS, 164 BOULEVARD MONTPARNASSE,
January 13, 1890.

MY DEAR GENERAL: I take pleasure in acknowledging the receipt of your letter of the 31st ultimo, and in sending you a brief synopsis of the Riggs collection of arms and armor, with two collateral publications that will enable you to convey some idea of its character and worth to the country, in your report on the late French Grand Exposition.

This collection numbers between four thousand and five thousand pieces, consisting of complete suits of armor, and parts of armor of every kind, employed for the protection of man and horse in warfare and in other combats, from the beginning of the mediæval period down to the end of the seventeenth century; also specimens of all sorts of weapons and of implements connected with military service during the same period. Its contents may be classified as follows:

One hundred complete suits and half-suits of armor used in war, tournaments, carrousels, tiltings, and official parades, exhibiting every phase of elegant ornamentation peculiar to these objects in time and place.

Fifty specimens of chain-mail, worn before the adoption of plate armor.

Two complete panoplies for man and horse, one of which is displayed on models duly caparisoned.

Four brigandines, very rare.

Sixty bucklers, many of them richly embossed and decorated in the highest style of mediæval and renaissance art.

Two hundred helmets or casques, in every form, and of every style of ornamentation, from the Norman period down.

Five hundred swords, of great variety of hilt and blade, serving every purpose, and of different epochs and countries.

Twenty two-handed swords.

A series of daggers.

Seven series of gauntlets.

Six hundred halberds and lances, belonging to every country and of every shape.

A series of maces, hammers, and battle-axes.

A complete series of bits, stirrups, and spears.

Two hundred specimens of fire-arms, including pistols, arquebuses, and other instruments for projectiles, from the fifteenth to the end of the seventeenth century, richly decorated and of various styles and designs.

Banners, flags, and pennons.

A large series of detached pieces of armor, embracing gauntlets, lancerondals, spauldrons or shoulder-pieces, leg armor, and other parts.

This brief synopsis suggests the archæological and technical importance of the collection; its artistic importance can be estimated only by actual examination of it. Apart from the value of the collection from this point of view, it contains several unique historical pieces of special interest, of which the following are the principal:

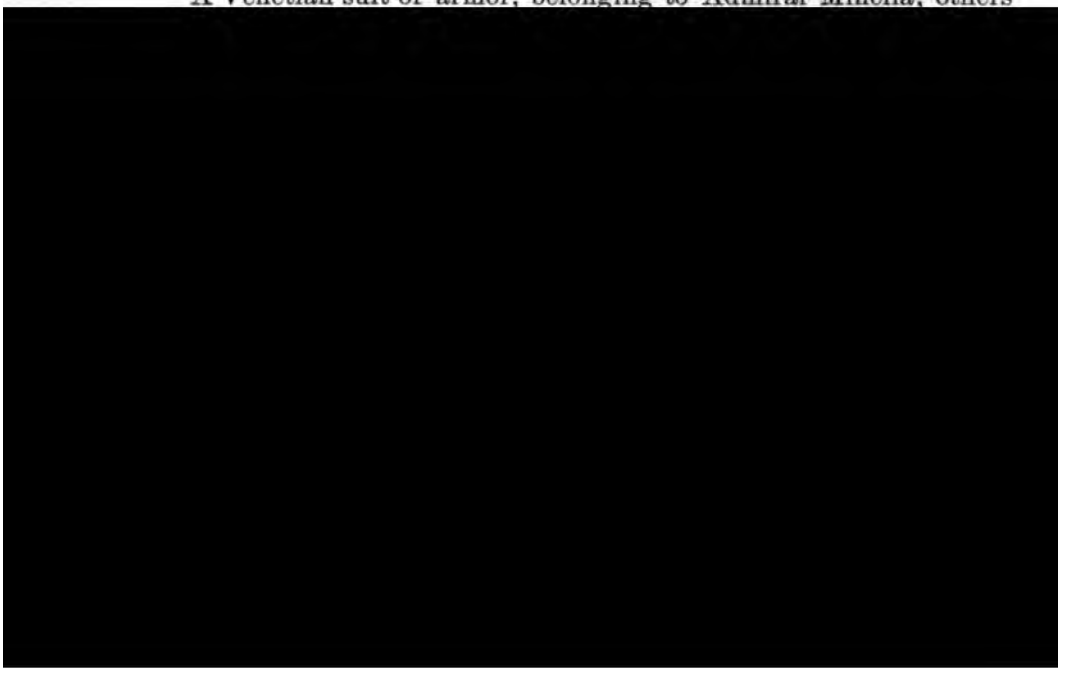
A suit of armor, embossed and damascened, belonging to the famous Duke of Alva, conspicuous in the history of the Netherlands and of Spain, and which has been estimated by good authority as worth 100,000 francs.

A suit of armor, said to have belonged to Henry IV of France, ornamented in large niello style, bearing the marks of manufacture for royalty, and portrayed in one of the well-known portraits of this monarch.

A suit of armor, bearing the arms of Lorenzo de Medici, elaborately engraved and gilt.

An equestrian figure in full panoply, representing the Grand Duke Colonna, Duc de Polliano et Jagliacozzo, grand constable of the kingdom of Naples in the sixteenth century.

A Venetian suit of armor, belonging to Admiral Minella; others



Of the bucklers, several are of finest workmanship and design, including an example of the genius of the brothers Negroli, worked out in high relief, exquisite in artistic treatment, admirable in composition, enriched with damascenery and gilding, which may be considered priceless.

One of the brigandines, a species of armor formed of steel scales attached to green velvet, with an inner lining of chain armor, belonged to Amadeus VI, Count of Savoy, ancestor of Victor Emmanuel. The present King of Italy lately bought, it is said, a similar relic of the time for 14,000 francs, much inferior to this in condition.

Among the gauntlets are pairs belonging respectively to Henry VIII of England and Philip II of Spain.

In pistols and arms of this category there are pairs once belonging to Henry II of France; also arquebuses serving as models of ivory incrustation, of priceless value. Among the stirrups one pair bears the monogram of Diana de Poitiers. Other pieces of nearly equal importance are too numerous to mention. The catalogue of this collection still remains unfinished. Judging by what I have seen of it, projected on a large scale, it will take time to complete it, and when done it will form a volume of considerable size.

I have to add that Mr. Riggs intends to present, along with his collection of arms and armor, a fine collection of stained glass containing many rare specimens. The value of the Riggs collection may be stated in round numbers at $1,000,000.

* * * * * * *

Very truly,

J. DURAND.

General WM. B. FRANKLIN,
Commissioner-General.

OFFICIAL JOURNAL OF THE FRENCH REPUBLIC, DECEMBER 11, 1889.

[The room devoted to the collection of Mr. Riggs.]

ARMOR FOR MAN AND HORSE.—ARMOR OF THE DUKE OF ALVA.—LEG ARMOR OF THE FOURTEENTH CENTURY.—CASQUE OF THE VISCONTIS.—CASQUE (BOURGUIGNOTTE) OF DUKE FERDINAND OF TYROL.—BUCKLER AND CASQUE OF THE ROSMINIS OF UDINA.—SWORD SAID TO HAVE BELONGED TO FRANCIS I.—RAPIER OF THE XIMENES.—PROBABLE DEPARTURE OF THE COLLECTION FOR THE UNITED STATES.

The second room, devoted to ancient arms and arms of luxury, is that which contains the valuable collection of Mr. Riggs. This amateur had already exhibited a collection of arms at the Palace of the Trocadéro in 1878, which specially attracted the attention of visitors. A whole room, and one of the largest of the Palace of the Ministry of War, does not suffice to hold all the riches of this large collection. In fact, we have under our eyes only about three-fifths of the collection of Mr. Riggs. We shall not speak of the continued efforts it has cost this amateur to collect so great a number of rare arms and suits of armor, nor of the immense money value it represents; all the world understands this. But what one realizes less is

the trouble, the labor, which an exhibition of this kind involves, to have it properly prepared by skilled workmen, to classify it, label it, etc. Hundreds of pieces require unintermitted work for many months. Mr. Riggs is entitled, then, to the thanks of all who have visited his exhibit, and they are numerous. Among the many tasks which the installation of this room imposed, we have intentionally omitted to speak of the preparation of a catalogue. This is because, unfortunately, from circumstances beyond his contro , Mr. Riggs was unable to realize this desideratum. Therefore, in calling attention to some of the most interesting articles, we shall give a little more detailed description than we have done in the preceding room. We begin our list with the armor, and we shall continue it with the casques, bucklers, etc. We shall call attention only to three or four of the rarer types of these series.

In the middle of the room was a beautiful suit of armor, both of parade and service, for man and horse. This suit belonged to the Grand Duke Marie-Antoine de Colonna, Duke of Polliano and Jagliacozzo, Grand Constable of the Kingdom of Naples in the sixteenth century. It is engraved in arabesques of flowers and cartouches of Roman emperors, and bears on every piece the arms of the Colonnas, as well as the Grand Constable's truncheon. The horse's armor consists of a hog-backed crupper, of a jointed breast-plate, of flank pieces, of a service saddle with ornaments in colors of the Colonnas, stirrups of iron plated with copper and covered with a lining of sole-leather, and a spiked chanfrin (head-piece) with its barbe of horsehair, and lastly of a bridle with a bit with long branches and reins covered with plates of chased steel. This valuable historic suit of armor is completed by an emblazoned shield. It was found by Prince Soltikoff in the town hall of Botzen, in the Tyrol, and was formerly a part of the Ambras collection.

In one of the central glass cases were placed the two following suits of half-armor: (1) A suit of half-armor repoussé, chased and damascened in gold and silver, having belonged to Alvarez de Toledo, Duke of Alva, Governor of the Low Countries. This suit of armor, the work of the celebrated artist Giulio Piccimino, and given to the Duke of Alva by Philip II of Spain, was saved from the fire of the Chateau of Lemos. (2) An Italian suit of half-armor of the first half of the sixteenth century, chased and gilt all over in imitation of stuffs of that period. A portrait of Lorenzo de Medici in the Pitti Palace represents him wearing this

the same subject richly repoussé, gilt and damascened. An Italian casque of the sixteenth century, of heroic shape, with indented crest; the sides are ornamented with fleurs-de-lis, from which spring boughs with branches in leaf, and in front the serpents of the Visconti. An Italian casque (bourguignotte) with high crest, of the sixteenth century; the comb (*peigne*) is ornamented with medallions of warriors resting, and sea-horses repoussés, cut and embossed on a gilt ground; the umbril (modern visor) and neck-guard are decorated with chased fillets and gilt masks of the period, fine Milanese work. A German casque (*bourguignotte*) of the Grand Duke Ferdinand of Tyrol, afterwards Emperor of Germany, entirely covered with fillets chased in relief and gilt, bearing the initials of the Duke, and the crown and eagles of the Tyrol. The rest of this suit of armor is preserved at Vienna.

In the celebrated Ambras collection, an Italian full-dress casque (*bourguignotte*) of the sixteenth century, ornamented with gilt chasings in imitation of the brocade of that period, and bearing a crest in form of gilt and repou sé foliage; this piece formed part of a suit of armor belonging to the Medicis, who own the collection. A Spanish service casque (*armet*) of the sixteenth century, which belonged to the Duke of Alva, chased and gilt, and bearing crowns under which is a monogram spelling "Alvares de Toledo;" it was found, in excavating, in one of the chateaux of the Duke of Alva. A knight's casque (*armet*) of the sixteenth century, French, with double visor, chased and gilt in fillets of trophies of arms, interspersed with dolphins.

Here is a buckler called "rotella," in repoussé iron, chased and embossed. The principal subject, in bas-relief of the purest style, represents St. George mounted, piercing the dragon with his lance; in the distance, on one side, the figure of a queen kneeling, and on the other, two warriors dressed in oriental costume; a landscape and a view of a city in the background. All the figures, in bold relief and chiseled with the greatest care, are enriched with gilding, and are finely embossed, particularly in the draperies and accessories; the landscape and the buildings are enriched with gold and silver, and are in part damascened. The outer edge, of great beauty, incloses in graceful curves trophies of arms and four medallions with allegorical figures. This superb buckler of Italian workmanship, by the brothers Negroli, armorers of the manufactory of Milan in the sixteenth century, comes from the family of Rosmini of Udine, whose arms it bears (0.60 cent. in diameter, about two feet). A casque called "Spur Morion," in repoussé iron, chiseled and embossed in the same style as the buckler above described, and from which it ought not to be separated, as it forms part of the same suit of armor, and resembles the buckler, not only in ornamentation, but in design, in subject, in workmanship, and in origin. The two subjects which decorate them are the same; that is to say, St. George in different attitudes slaying the dragon, a subject repeated again in the charming plume-holder. Below we find the stamp of the brothers Negroli, a skull and two cross-bones.

A German round buckler of the sixteenth century, ornamented in the center with the head of a lion repoussé, chased and gilt, on a dark dotted background. The outer edge is also chased and gilt in arabesques. An Italian buckler of the sixteenth century in repoussé iron, chased and bearing traces of gilding and damascening. The principal subject is Mucius Scævola before Porsenna, surrounded by numerous persons of importance. The outer edge is repoussé with a frieze of scrolls, showing dragons and allegorical figures. An Italian buckler called "rotella" of the sixteenth century, in polished iron, and entirely repoussé in bold relief, divided into sections, ornamented with chimeras, trophies of arms, and crowns. The umbo [centre], having a spike chased with leaves, is surrounded by branches and masks, with emblazoned escutcheon—a masterpiece of repoussé work. An Italian buckler of the sixteenth century called "rotella," all repoussé, divided into sections, framed by leafy scrolls, joined together by gilt ribbons. In the centre the figure of Min-

erva seated and holding Victory is surrounded by trophies of arms, the whole finely embossed. Four medallions of warriors and busts of women, also embossed, complete the ornamentation in the most perfect taste.

Let us pass to the swords. The specimens of the sixteenth and seventeenth centuries, in all the collections that we have seen, are so well conceived and so elegant that they charm the eye and make one wish to wield them. The specimens which follow are of the first rank. Dress sword said to have belonged to Francis I. Its pommel pear-shaped, flattened, incloses in a chased frame a pomegranate with gilt seeds, with side pendants of fruit in open work. The upper part is cut in medallions of warriors, after the antique, on a ground plated with gold, and the neck of the pommel is ornamented with horned masks chiseled in bas-relief on a gilt ground. The handle, joined to the pommel by acanthus leaves, falls on the sheath in lobes, with pendants of silver tears. The bars astride, chased in acanthus leaves, and in lobated grooves, sprinkled with gold beads and silver flowerets, have only one *pas d'âne* (guard), terminating in a fool's head, with bolts on the chin, and capped with a gilt circle and a diadem; the cross-bar of the guard is terminated by armless busts of warriors, after the antique, wearing heroic casques. The parade cross-bar terminates in a woman's body, wearing a diadem, and bearing in her arms two chased and gilt bucklers. The guard is connected with the shoulder by masks in bas-relief, cut in the solid, and terminated by fleurs-de-lis in gold. The large two-edged blade, with short shoulder, bears the inscription "Petit fecit" [Petit manufactured]. A tradition of the Montmorencys, from whom comes this splendid weapon, relates that it was given by Francis I to Anne of Montmorency, Grand Constable of France. An armorer of the name of Petit, attached to the royal saddlery of the King, and a pupil of Benvenuto Cellini, afterwards became armorer of Charles V and of Philip II of Spain. The masterly composition of this weapon is essentially French, and the masks alone seem to indicate the Italian influence of the school of Cellini.

A German sword of the end of the fifteenth century, the blade slightly grooved, and bearing the following inscriptions, engraved on a black ground in old German text; they may be translated as follows: "Look well and watch; look out for him who would injure you. Want of faith is in fashion. Take care, avoid me; if I strike you I cut you in pieces." We see on the shoulder, finely chiseled, the face of the Virgin and that of Saint Theresa. The guard, twisted into an S, bears the inscription, "A new saint called 'Brigand,' to whom all the world pays homage." The handle, of

wolf: the guard of long, straight cross-bars, with bossed ends, is completed by two sub-guards supported on the ridge of the blade; the pommel is in flattened pear shape: the handle of hardened leather, stamped in flowers and foliage, bears the three coats-of-arms of the Malâtesta, Lords of Rimini. A sword remarkably well preserved. and procured from the descendants of the family.

A very large two-handed German sword of the sixteenth century; the guard bent back, and terminated by eagles' heads, is chiseled and gilt on a blue ground, as well as the pommel. The handle, covered with velvet and leather, has preserved its yellow and black trimmings. The blade, the shoulder of which is trimmed with leather, bears, chased and gilt on a black background, the eagle and imperial crown of Austria.

We close here our visit to the collection of Mr. Riggs. Many other objects of art might be cited,—superb wheel-pistols of the sixteenth century; arquebuses, with stocks all inlaid with ivory; powder-flasks, halberds, partisans, etc.

We have not wished to, and we could not, give more than an idea of this admirable collection. Why must all these beautiful arms, borne by so many valiant soldiers, leave us forever? Mr. Riggs, who is of American nationality, intends to present this beautiful collection to his fatherland. Negotiations are in progress for preparing for these arms a home worthy of them at Washington. This is, therefore, one of the last, perhaps the last time, that our amateurs will have the opportunity to admire at Paris all these souvenirs of a glorious past.

APPENDICES

TO THE

REPORT OF THE COMMISSIONER-GENERAL.

APPENDIX A.

DECREE OF THE PRESIDENT OF THE FRENCH REPUBLIC.

DECREE OPENING THE UNIVERSAL EXPOSITION OF 1889 AT PARIS.

The President of the Republic, on the report of the Minister of Commerce, decrees:

ARTICLE 1. A Universal Exposition of the Products of Industry shall be opened in Paris May 5, 1889, and closed October 31 following.

ART. 2. A later decree will determine the conditions under which the Universal Exposition shall be held, the rules to which the articles admitted shall be subjected, and the different kinds of products which may be admitted.

ART. 3. The Minister of Commerce is charged with the execution of this decree.

JULES GRÉVY,
President of the Republic.

Done at Paris, November 8, 1884.

MAURICE ROUVIER,
Minister of Commerce.

AGREEMENT WITH THE SOCIETY OF GUARANTEE.

Between the undersigned,—

1. The Minister of Commerce, etc., for and on account of the State, of the first part: 2. The Prefect of the Seine, in the name of the city of Paris, of the second part: 3. M. Albert Christophle, for and on account of the Society of Guarantee to be formed for the Universal Exposition of 1889, of the third part,—

The following has been agreed upon:

ARTICLE 1. The expenses of all kinds on account of the Universal Exposition, etc., are limited to the sum of forty million francs.

A further sum of three million francs shall be set apart to be used for unforeseen works, or for modifications of plans in course of execution.

ART. 2. To meet these expenses,

a) The Minister of Commerce, in the name of the State, agrees to contribute seventeen million francs.

b) The Prefect of the Seine, in the name of the city of Paris, agrees to contribute eight million francs.

c) To provide the amount constituting the difference between the contributions of the State and the city of Paris, *i. e.*, twenty-five million francs, and the forty-three million required for the works and expenses of the Exposition, the founders of the Society of Guarantee agree to provide under the conditions hereinafter set forth a sum which can, under no circumstances, and whatever may be the final total of expenses, exceed eighteen million francs.

ART. 3. The contributions of the State and city of Paris shall be first employed to meet the expenses of the Exposition, and no call shall be made upon the Society of Guarantee until these contributions are exhausted.

* * * * * * *

ART. 5. In case the receipts of the Exposition, added to the subvention of twenty-five million to be furnished by the State and city of Paris, should exceed the amount of expenses of all kinds of the said Exposition, this excess shall be considered as profits, and divided between the State, the city of Paris, and the Society of Guarantee, in the proportion of their respective contributions.

ART. 6. In case, in consequence of extraordinary circumstances, the expenses of all kinds which the Exposition of 1889 may entail, shall exceed forty-three million francs, the excess shall be paid by the State, which, to compensate itself, shall have the benefit of all receipts exceeding eighteen million francs, before any payments can be made to the city of Paris or to the Society of Guarantee, and this until the said excess of expense has been paid.

ART. 7. The direction and superintendence of the Universal Exposition of 1889 belongs to the State.

A Commission of Control and Finance, composed of members representing the State, the city of Paris, and the Society of Guarantee, in proportion to their respective contributions, shall be appointed.

The members of this Commission shall be named by decrees of the President of the Republic, inserted in the Official Journal. The Minister of Commerce, etc., shall preside.

This Commission shall administer and control the Society of Guarantee. It shall be consulted by the Minister of Commerce, etc., on all questions bearing on the financial management of the Exposition. Nothing shall be done without its assent in any matter relating to revenue of any kind to be collected on account of the Exposition.

ART. 8. No free tickets shall be issued, except those strictly personal, distributed among the exhibitors and employés.

In case during the Exposition free tickets should be issued, these tickets shall, as regards the Society of Guarantee, be considered as paying tickets, and be credited to the Society as such.

The rent which may be charged to exhibitors on account of space allotted them must not enter into the calculation of the receipts referred to in Article 5 of the agreement, except so far as may be necessary to make up a total of eighteen million francs.

ART. 2. The State shall contribute to the expenses of the Exposition of 1889 by a grant of seventeen million francs.

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In case the expenses shall not reach the sum of forty-three millions referred to in Article 1 of the Agreement, the amount saved shall be credited to the State alone.

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ART. 5. The receipts and expenses of the Exposition shall be managed by agents of the Treasury, and submitted to the control of the Board of Audit (Cour des Comptes.)

The subvention granted by the City of Paris, as well as the receipts coming from the management of the Exposition, shall be turned into the Treasury. * * *

ART. 6. Proposals of every kind in reference to the construction, the fitting up, and the working of the Exposition, shall, before their execution, be submitted for the approval of the Minister of Commerce, etc.

ART. 7. A detailed account of the receipts and expenditures of the Exposition shall be presented to the President of the Republic in a report, which shall be published, and distributed to the Senate and Chamber of Deputies.

Every year a report, published under the same conditions, shall make known the progress of the works, and the expenses incurred and paid.

APPENDIX B.

FRENCH LAWS AND REGULATIONS.

PARIS INTERNATIONAL EXHIBITION, 1889.

ARTICLE 1. The convention concluded by the Minister of Commerce and Industry representing the state, the prefect of the Seine, representing the city of Paris, authorized by the decision of the municipal council of March 31, 1886, and the governor of the Credit Foncier, acting for the Guarantee Association, which is to be established for the World's Exhibition of 1889, is hereby approved.

No expense shall be incurred beyond the amount of 43,000,000 francs, for which provision is made by Article 1 of this convention, unless provision shall previously have been made therefor by a special law.

Such proceeds as may accrue from payments required of exhibitors for the space assigned to them shall not enter into the computation of the receipts provided for by Article 5 of the convention, beyond the amount necessary to make the total receipts 18,000,000 francs.

ART. 2. The state shall contribute to the expenses of the Exhibition of 1889 by an appropriation of 17,000,000 francs.

The appropriation shall be charged (to the amount of 12,693,635 francs) to the loan of 80,000,000 francs made to the state by the Bank of France, in pursuance of the convention of March 29, 1878, approved by act of the 30th of June following.

In case the expenses shall amount to less than the sum of 43,000,000 francs, which is provided for by Article 1 of the convention, the saving effected shall inure to the benefit of the state alone.

ART. 3. The sum of 12,693,635 francs shall be allowed by way of an extraordinary appropriation, to the Minister of Commerce and Manufactures, on the fiscal year 1886, over and above the allowances made by the financial act of August 8, 1885. This allowance shall form a special chapter entitled "No. 43. Amount contributed by the State to the Expenses of the Exhibition of 1889."

This extraordinary appropriation shall be paid from the source mentioned in the foregoing article.

ART. 4. The appropriations necessary for the expenses of the years 1887, 1888, 1889, and the following, shall be made, within the limits of the allowance above fixed, by the annual appropriation laws.

Nevertheless, during the recess of the chambers, in pursuance of Article 5 of the act of December 14, 1879, such appropriations may be made by decrees approved by the council of ministers. These decrees shall be submitted to the chambers for their sanction within the first fortnight after their next meeting.

ART. 5. All moneys for the Exhibition shall be received and expended by the officers of the treasury, and shall be submitted to the court of accounts for inspection.

The subsidy allowed by the city of Paris, together with all receipts accruing from the World's Exhibition of 1889, shall be paid into the treasury as funds for public expenses, according to Article 13 of the act of June 6, 1843.

ART. 6. Plans of all kinds relative to the construction, arrangement, and management of the Exhibition of 1889 shall, before being put into execution, be submitted to the Minister of Commerce and Manufactures for his approval.

ART. 7. A detailed statement of the receipts and expenditures of the World's Exhibition of 1889 shall be presented to the President of the Republic in a report which shall be published and distributed among the senators and members of the Chamber of Deputies.

A report published in the same way shall annually make known the state of advancement of the work, and shall furnish a statement of the expenses incurred.

ART. 8. The instruments designated in Article 1, paragraph 9, of the act of February 28, 1872, and approved by the Minister of Commerce and Manufactures, in pursuance of this act, shall be subjected to a fixed duty of 3 francs. This act having been adopted by the Senate and Chamber of Deputies, shall be executed as a law of the state.

MINISTERIAL ORDER OF AUGUST 26, 1886.

General Regulations.

ARTICLE 1. In pursuance of the decrees issued by the President of the French Republic, at the suggestion of the Minister of Commerce and Manufactures, and of the Minister of Public Instruction, Fine Arts, and Worship, an International World's Exhibition shall be opened at Paris on the 5th day of May, 1889, and shall be closed on the 31st of October following.

No production shall, however, be admitted in the Exhibition after April 1, 1889.

ART. 2. This Exhibition shall receive works of art and productions of the industry and agriculture of all nations.

It shall be held principally in the Champ de Mars, in the unoccupied space between Lamotte-Piquet avenue and the square situated near the quay. It may extend—

ART. 6. The Advisory Committee on Superintendence and Finance, which is to be appointed by a decree of the President of the Republic, shall be presided over by the Minister, or, in his absence, by one of the three vice-presidents, each in his turn.

It shall be convoked by the Minister, who shall fix the order of its daily proceedings.

ART. 7. This commission shall be consulted by the Minister on all questions having reference to the financial management of the Exhibition. Its advice shall be acted upon in all cases in which questions are concerned relating to receipts of all kinds to be collected on the occasion of the Exhibition.

ART. 8. The other committees may subsequently be completed by the addition of new members, to be appointed by ministerial orders.

Their chairmen shall be appointed by the Minister.

Their vice-chairmen and secretaries shall be designated by the committees themselves, subject to the approval of the Minister.

They may be subdivided into sub-committees, with the approval of the Minister, who shall designate the new chairmen.

ART. 9. The Minister shall lay suitable matters directly before the committee and sub-committees.

ART. 10. The Directors-General, who are to be appointed in the manner provided by the decree of July 28, 1886, shall be charged, each in that which concerns him, with the preparation and submission to the Minister, Commissioner-General, of the plans relative to the construction, arrangement, and management of the Exhibition. They shall be admitted to all sessions of the Committee on Superintendence and Finance, and to the sessions of committees having charge of matters connected with their respective branches. They shall at these sessions have the right of discussion, but not that of voting.

Admission and Classification of Productions.

ART. 11. A departmental committee, appointed by the Minister of Commerce and Manufactures, shall be instituted in each department of the French Republic. The duties of this commission shall be—

(1) To make known throughout the department the regulations concerning the organization of the Exhibition, and to distribute the blank forms of applications for admission, together with all other documents relating to the Exhibition.

(2) To furnish, with as little delay as possible, the names of the principal artists, agriculturists, and manufacturers whose admission to the World's Exhibition shall seem particularly calculated to promote the success of that enterprise.

(3) To promote the exhibitions of industrial, agricultural, and horticultural productions of the department.

(4) To promote and organize, if deemed desirable, the collective grouping of similar productions of the department, and to accredit a delegate, whose duty it shall be to represent each collective exhibition.

(5) To prepare, if this shall be thought desirable, by way of subscription or otherwise, the establishment of a special fund, designed to facilitate the examination and study of the World's Exhibition by a certain number of master-workmen, workmen, and cultivators of the department.

ART. 12. Foreign commissions appointed at the request of the French Government are urged to send their delegates with as little delay as possible.

The duty of each delegate shall be to discuss such questions as may interest his countrymen, and especially such as relate to the distribution of the entire space among the different countries, and to the method of installation of each national section. Consequently, the Minister, Commissioner-General, will not correspond

directly with foreign exhibitors, and all productions presented by foreign producers shall be admitted only through the agency of their respective commissioners.

ART. 13. The departmental committees appointed by the Minister and the foreign commissioners regularly accredited to him shall enter into direct relations with the Director-General of management.

The foreign commissioners shall receive from him all suggestions and plans with regard to the most advantageous installation of the productions of their nations, together with all information concerning the conditions of general circulation and of public order to which they shall be obliged to conform.

They shall have recourse to him for all changes of space from country to country.

ART. 14. In each section devoted to the productions of the same nation, the articles exhibited shall be divided among the nine groups following:

First Group: Works of Art (Class 1 to 5).
Second Group: Education, Instruction, Materials and Processes used in the Liberal Arts (Class 6 to 16).
Third Group: Furniture, etc. (Class 17 to 29).
Fourth Group: Textile Fabrics, Wearing Apparel, etc. (Class 30 to 40).
Fifth Group: Extractive Arts, Raw and Manufactured Products (Class 41 to 47).
Sixth Group: Apparatus and Processes used in Mechanical Industry—Electricity (Class 48 to 66).
Seventh Group: Food Products (Class 67 to 73).
Eighth Group: Agriculture, Vine Culture, and Pisciculture (Class 74 to 77).
Ninth Group: Horticulture (Class 78 to 83).

Each of these groups shall be divided into classes, according to the system of general classification appended to these regulations (Annex No. 1).

That document shall comprise for each class a compendious enumeration of the articles which it is to include.

ART. 15. A methodical and complete catalogue of the productions of all nations shall be prepared in the French language. This catalogue shall state the places to be occupied by said productions in the halls, the parks, or the gardens, together with the names of the exhibitors.

Each nation shall, moreover, have the right to prepare, at its own expense, but

of designs for manufactured articles, exhibitors shall enjoy the rights and immunities granted by the aforesaid act. (Annex No. 2.)

ART. 20. In pursuance of the decree issued on the 25th of August, 1886 (Annex No. 3), the Exhibition is to be, in fact, a bonded warehouse; consequently articles exhibited are to be exempted from the payment of city dues and from search by the municipal authorities of Paris, and also from the payment of duties at the French custom-house and from search there.

ART. 21. Subsequent regulations shall in due time determine the methods of shipment, of reception, and of installation of the productions, the method of admission to the premises of the Exhibition, and the formation of the international jury on premiums, whose duties shall begin as soon as the Exhibition is opened.

Special Provisions Relative to Works of Art.

ART. 22. The works of French and foreign artists executed since May 1, 1878, shall be admitted to the Exhibition.

ART. 23. Such works shall comprise the seven kinds below mentioned:

(1) Paintings.

(2) Drawings: Water-colors, pastels, miniatures, enamel, porcelain, and cartoons, not including those which represent subjects of ornamentation only.

(3) Sculpture.

(4) Engravings on metals and precious stones.

(5) Architecture.

(6) Engraving.

(7) Lithography.

ART. 24. The following shall be excluded:

(1) Copies, even such as reproduce a work in a style different from that of the original.

(2) Unframed paintings or drawings.

(3) Sculptures in unbaked clay.

ART. 25. It shall be the duty of a special jury to decide concerning the admission of works of art.

ART. 26. The requirements to be fulfilled for applications for admission shall be fixed by subsequent regulations. Another regulation shall also indicate the method of shipment and of reception of works of art.

ART. 27. Decision shall be given hereafter with regard to the number and nature of the premiums to be awarded, and also concerning the appointment of an international jury for the award of premiums.

Special Provisions Relating to Industrial and Agricultural Products.

ART. 28. All manufactured and agricultural productions shall be admissible to the Exhibition, with the exceptions and reservations mentioned in the following article:

ART. 29. Detonating and fulminating articles and, in general, all matters regarded as dangerous, shall be excluded.

Spirits or alcohols, oils and essences, corrosive substances, and in general any articles that may injure other productions with which they may come in contact, or that may incommode the public, shall not be received otherwise than in solid vessels suitable for containing them, and of small dimensions.

Percussion caps, fireworks, chemical matches, and other similar objects shall not be received. Imitations thereof may, however, be received, provided that they contain no inflammable matter.

ART. 30. Exhibitors of injurious productions or those calculated to impair the health of human beings must, at all times, conform to such precautionary measures as may be prescribed.

ART. 31. The Director-General of management may at all times cause the removal of all articles, no matter what may be their origin, which, owing to their nature and their appearance, may appear to be objectionable or incompatible with the object or the decorum of the Exhibition.

ART. 32. French applications for admission must be drawn up according to the form appended to these regulations. (Annex No. 4.)

Applications from Paris and the department of the Seine are to be sent directly to the Minister of Commerce and Manufactures, Commissioner-General, No. 35 Quai d'Orsay, Paris, or to the Director-General of management, No. 80 Rue de Varenne.

Those from the departments are to be received by the departmental committees, who will forward them to the same addresses.

All applications of French citizens, thus centralized, shall be submitted by classes to the examination of committees on admission, appointed by the Minister, and from whose decisions there shall be no appeal. It is essential that all applications be handed in as speedily as possible.

The printed blank forms of applications for admission shall be furnished to the public gratuitously, at the following places:

(1) At Paris: At the Ministry of Commerce and Manufactures, No. 25 Quai d'Orsay and No. 244 Boulevard Saint Germaine; at the buildings of the Management of the Exhibition (Avenue de la Bourdonnais and Rue de Varenne, No. 80): at the Tribunal, and at the Chamber of Commerce.

(2) In the departments: At the prefectures, subprefectures, chambers of commerce, tribunals of commerce, advisory chambers of arts and manufactures, and at the locations of the departmental committees, as well as at such places of distribution as may be designated by the said committees.

ART. 33. Constructors of apparatus requiring the use of water, gas, or steam must state, either at the time of making their application for admission or through the foreign delegates, the quantity of water, gas, or steam that they require.

Those desiring to set machinery in motion shall state the exact velocity of such machinery and the motive power which it will require.

ART. 34. Water, gas, steam, and motive power for the machinery galleries shall be furnished gratuitously.

The power shall be taken from the vehicle of general transmission.

Foreign commissions shall have full control as regards the custody of their respective sections. The officers designated by them for the performance of this duty shall be commissioned by the Commissioner-General. They shall wear a uniform or a distinctive badge; they may, under all circumstances, apply for assistance to the French officers and policemen who shall walk through the passages open to the public, or who shall be stationed there.

In the French section, the exhibitors of each class shall make arrangements for the organization of a collective system of guardianship, independent of the general surveillance. The special officers of this class shall be commissioned by the Minister, Commissioner-Ceneral; they shall wear badges indicating the number of the class whose rooms they are to watch.

ART. 41. It is expressly understood that the state disclaims all responsibility for any thefts and embezzlements that may be committed.

ART. 42. No article shall be advertised by means of hand-bills, prospectuses, etc., within the Exhibition, by exhibitors, holders of concessions, or any other person, without regular authorization and prepayment of such fees as may be required.

ART. 43. All communications relative to the Exhibition must be addressed to the Minister of Commerce and Manufactures, Commissioner-General, No. 25 Quai d'Orsay, Paris, and must bear on the envelope the words "World's Exhibition of 1889." (Exposition Universelle de 1889.)

ART. 44. Both French citizens and foreigners, by becoming exhibitors, declare by that very fact that they adhere to the provisions contained in Articles 11–42 of these regulations.

EDOUARD LOCKROY,

Minister of Commerce and Manufactures, Commissioner-General.

PARIS, *August* 26, 1886.

PROTECTION OF INVENTIONS.

Law of May 23, 1868, *relating to the guaranty of inventions capable of being patented and of industrial designs, which shall be admitted to public expositions authorized by the Government throughout the whole Empire.*

ART. 1. Every Frenchman or foreigner, author of a discovery or invention capable of being patented under the provisions of the law of July 5, 1844, or of an industrial design which may be registered conformably with the law of March 18, 1806, or his representatives may, if admitted to a public exposition authorized by the Government, cause the delivery to them, by the prefect or the sub-prefect of the department or arrondissement in which the Exposition is opened, of a certificate describing the object exhibited.

ART. 2. This certificate assures to its receiver the same rights which a patent of invention or a legal registration of an industrial design would grant, dating from the day of admission and extending to the end of the third month following the closing of the Exposition, without prejudice to the patent which the exhibitor may receive or to the registration he may effect before the expiration of this period.

ART. 3. The request for this certificate is to be made within the first month, at very latest, from the opening of the Exposition.

It is to be addressed to the prefecture, or sub-prefecture, and to be accompanied by an accurate description of the thing to be guaranteed, and, if there be occasion, by a plan or drawing of the said article.

The requests as well as the decisions made by the prefect or sub-prefect are to be recorded in a special register, which shall be afterwards transmitted to the department of agriculture, commerce, and public works, and communication of its contents shall be made, without charge, on every request.

The delivery of the certificate shall be free of costs.

SYSTEM OF GENERAL CLASSIFICATION.

FIRST GROUP—WORKS OF ART.

CLASS 1.—OIL PAINTINGS.

Paintings on canvas, panels, and various grounds.

CLASS 2.—PAINTINGS OF DIFFERENT KINDS AND DRAWINGS.

Miniatures; paintings, in water-colors; pastel and drawings of all kinds; paintings on enamel, earthenware, and porcelain; cartoons for stained glass windows and frescoes.

CLASS 3.—SCULPTURE AND ENGRAVINGS ON MEDALS.

Statuary, bas-relief, repoussé work and chiseled work. Medals, cameos, engraved stones. Inlaid enamel work.

CLASS 4.—ARCHITECTURAL DRAWINGS AND MODELS.

Studies and fragments. Representations and plans of buildings. Restorations from ruins or documents.

CLASS 5.—ENGRAVINGS AND LITHOGRAPHS.

Engravings in black; polychromatic engravings. Lithographs in black, in chalk and with brush; chromo-lithography.

SECOND GROUP—EDUCATION AND INSTRUCTION—APPARATUS AND PROCESSES USED IN THE LIBERAL ARTS.

CLASS 6.—EDUCATION OF YOUNG CHILDREN—PRIMARY INSTRUCTION—INSTRUCTION OF ADULTS.

Plans and models of infant asylums, infant schools, orphan asylums, rooms for the

CLASS 8.—ORGANIZATION, METHODS AND APPLIANCES FOR HIGHER INSTRUCTION.

Plans and models of academies, universities, medical schools, practical schools, technical and industrial schools, agricultural schools, observatories, scientific museums, amphitheatres, laboratories for teaching and experimenting.

Furniture and arrangements of such establishments.

Apparatus, collections, and appliances used in higher instruction and in scientific research.

Special exhibitions of learned, technical, agricultural, commercial, and industrial institutions and societies.

Scientific expeditions.

CLASS 9.—PRINTING AND BOOKS.

Specimens of typography; autographic proofs; lithographic proofs, black or colored; proofs of engravings.

New books and new editions of books already known; collections of works forming special libraries; periodical publications.

Drawings, atlases, and albums.

Musical publications.

CLASS 10.—STATIONERY, BOOKBINDING, AND ARTICLES USED IN PAINTING AND DRAWING.

Paper, cards and pasteboards; inks, chalks, pencils, pastels, office furniture and supplies, inkstands, letter-scales, etc., and copying-presses.

Articles made of paper, such as shades, lanterns, flower-pot covers, etc.

Record books, copy-books, albums, and note-books; bindings, movable bindings, cases, etc.

Various articles for washes and water-colors; paints in cakes, pastilles, bladders, tubes, and shells. Instruments and apparatus for use of painters, draughtsmen, and modelers.

CLASS 11.—ORDINARY APPLICATION OF THE ARTS OF DRAWING AND MODELING.

Industrial designs; designs obtained, reproduced, or reduced by mechanical processes. Decorative paintings, lithographs, chromo-lithographs, or engravings to be used in industries. Patterns and models for figures, ornaments, etc.

Molded, stamped, chiseled and carved articles. Cameos, seals, and various articles decorated by means of engraving. Industrial decorative plastic goods made by mechanical process; reductions, etc.

Coins and medals.

CLASS 12.—PHOTOGRAPHIC PROOFS AND APPARATUS.

Photographs on paper, glass, wood, textile fabrics, enamel, etc. Heliographic engravings, lithographic proofs, photo-lithographic proofs, photographic negatives, stereoscopic proofs, and stereoscopes. Enlarged proofs. Photochromy.

Instruments, apparatus, and raw material used in photography. Articles used in photographers' studios.

CLASS 13.—MUSICAL INSTRUMENTS.

Non-metallic wind instruments with simple mouthpieces, with reeds or pipes, with or without air-reservoirs.

Metallic wind instruments, simple, with extensions, with slides, with pistons, with keys and with reeds.

Wind instruments with keyboards: organs, accordions, etc.
String instruments, played with the fingers or with a bow, without keyboards.
Stringed instruments with keyboards; pianos. etc.
Instruments played by means of beating or friction.
Automatic instruments: hand organs and bird organs.
Separate parts of musical instruments and orchestral appliances.
Strings for musical instruments.

CLASS 14.—MEDICINE AND SURGERY.—VETERINARY AND COMPARATIVE MEDICINE.

Appliances, instruments, and apparatus used in anatomical, histological, and bacteriological work.

Normal and pathological anatomical specimens; histological and bacterioscopical preparations.

Instruments for medical examinations, both general and special.

Apparatus and instruments used in general, local, and special surgery.

Apparatus used in dressing wounds.

Apparatus used in plastic and mechanical prothesis; orthopedic apparatus; apparatus used in hernial surgery; bath and hydrotherapeutic apparatus; apparatus for medical gymnastics; appliances, instruments, and apparatus used in special therapeutics.

Instruments used in the practice of dental surgery.

Miscellaneous apparatus for the use of the infirm, sick, and insane.

Accessory articles used in the medical, surgical, and pharmaceutical service of hospitals and infirmaries.

Cases and chests of instruments and medicines for the use of army and navy surgeons. Articles for use in succoring the wounded on battle-fields.

Apparatus for the relief of the drowned and the asphyxiated.

Special appliances, instruments, and apparatus used by veterinary surgeons.

CLASS 15.—INSTRUMENTS OF PRECISION.

Philosophical apparatus and instruments.

THIRD GROUP.—FURNITURE AND ACCESSORIES.

CLASS 17.—CHEAP AND FINE FURNITURE.

Sideboards, book-cases, tables, toilet-tables, bedsteads, sofas, chairs, billiard-tables, etc.

CLASS 18.—UPHOLSTERERS' AND DECORATORS' WORK.

Bed furniture, upholstered chairs, canopies, curtains, tapestry, and other hangings.

Articles for decorating and furnishing. Molded pulp, and decorative articles of plaster, statuary, pasteboard, papier-mâché, etc. Frames. Paintings and decorations for churches.

Ornamental mantel-pieces.

CLASS 19.—CRYSTAL, GLASS, AND STAINED GLASS.

Crystal glass vases and goblets; cut, double and mounted crystal glass, etc. Ordinary vases and goblets. Common glassware and bottles.

Glass for windows and mirrors. Highly finished, enameled, crackled, filigreed, and tempered glass, etc.

Glasses and crystals for optical purposes; articles for ornament, etc.

Stained glass for windows. Mirrors, looking-glasses, etc.

CLASS 20.—CERAMICS.

Biscuit ware, hard and soft paste porcelain.

Fine earthenware with colored glazing, etc. Earthenware biscuit. Terra cotta. Enameled lava. Bricks and tiles. Ceramic stoneware.

Industrial mosaics and enamels.

CLASS 21.—CARPETS, TAPESTRY, AND OTHER FABRICS USED IN HOUSE-FURNISHING.

Carpets, moquettes, and tapestry, of rough or velvety surface. Carpets of felt, mats, etc. India rubber floor cloths, etc.

Fabrics used in furnishing, such as cotton, wool, or silk, plain or figured. Fabrics of horsehair, vegetable, leathers, moleskin, etc. Leather used for hangings and furniture. Oil-cloths and linoleums.

CLASS 22.—DECORATED PAPERS.

Printed papers. Paper with velvety surface, marbled, veined, etc. Paper for covers, for binding, etc. Artistic papers. Enameled and varnished papers. Imitations of wood and leather. Painted or printed shades.

CLASS 23.—CUTLERY.

Knives, penknives, scissors, razors, etc. Various articles of cutlery.

CLASS 24.—GOLDSMITHS' AND SILVERSMITHS' WORK.

Church plate; decorative and table plate; articles of gold and silver for the toilet, for office use, etc.

CLASS 25.—ART BRONZES AND CASTINGS.—ARTISTIC IRON-WORK AND REPOUSSÉ METAL-WORK.

Statues and bas-reliefs in bronze, cast-iron, zinc, etc. Castings with metallic coatings.

Repoussé work in copper, lead, zinc, etc.

CLASS 26.—WATCHES AND CLOCKS.

Separate parts, large or small, of clocks and watches.

Watches, chronometers, pedometers, various reckoners, etc. Mantel and other clocks; regulators and metronomes.

Astronomical clocks, marine chronometers; traveling clocks, alarm clocks, etc. Water clocks and hour-glasses.

CLASS 27.—APPARATUS AND PROCESSES FOR HEATING.—APPARATUS AND PROCESSES FOR LIGHTING OTHERWISE THAN BY ELECTRICITY.

Fire-grates, fire-places, stoves, and furnaces. Accessory appliances in heating houses. Kitchen ranges and apparatus for heating and cooking with gas.

Apparatus for heating by the circulation of hot water, steam, and heated air.

Lamps for lighting by means of various oils and essences.

Accessory articles for lighting. Matches.

Apparatus and accessory appliances for lighting by gas.

Apparatus for lighting by means of magnesium, etc.

CLASS 28.—PERFUMERY.

Cosmetics and pomatums. Perfumed oils; extracts and scented waters; aromatic vinegars; almond pastes; powders, pastilles, and scent-bags; perfumes for burning; toilet soaps.

Raw materials for perfumery.

CLASS 29.—LEATHER WORK—FANCY WOODEN ARTICLES—BASKETS AND BRUSHES.

Dressing cases and small fancy articles of furniture; liqueur cases and glove boxes.

CLASS 31.—THREAD AND FABRICS OF HEMP, FLAX, ETC.

Flax, hemp, and other spun vegetable fibers.
Linen and drills. Cambric. Linen fabrics, mixed with cotton or silk.
Fabrics of vegetable fibers, other than those of cotton, flax, and hemp.

CLASS 32.—THREADS AND FABRICS OF COMBED WOOL—THREADS AND FABRICS OF CARDED WOOL.

Combed wool; woolen yarn.
Muslins, Scotch cassimeres, merinos, serges, etc.
Woolen ribbons and laces mixed with cotton, thread, with silk or floss silk.
Fabrics of hair, pure or mixed.
Woolen shawls, pure or mixed.
Cashmere shawls.
Carded wool: worsted yarn.
Cloths and other fabrics of carded wool.
Blankets. Felt of wool or hair, for carpets and hats.
Woolen foot-wear.
Fabrics of carded wool, unfulled or slightly fulled; such as flannels, tartans, wansdown, etc.

CLASS 33.—SILKS AND SILK FABRICS.

Raw and thrown silks; floss silk yarn.
Fabrics of pure silk, plain, figured, and embossed.
Fabrics of silk mixed with gold, silver, cotton, wool, thread, etc.
Fabrics of floss silk, pure or mixed.
Velvets and plushes.
Ribbons of pure or mixed silk.
Shawls of pure or mixed silk.

CLASS 34.—LACES, NET, EMBROIDERY AND TRIMMINGS.

Laces of thread and cotton, made with the spindle, needle, or loom.
Laces of silk, wool, or mohair.
Silver and gold lace.
Silk and cotton net, plain or figured.
Embroidering in tambour work, crocheting, etc. Embroidery in gold, silver, and silk. Sacerdotal vestments. Embroidery, tapestry, and other work done by hand.
Trimmings of silk, floss silk, wool, mohair, sundry kinds of hair, horsehair, thread and cotton; braids, etc.
Fine and imitation lace work and trimmings. Special lace work and trimmings for military equipments.

CLASS 35.—ARTICLES OF HOSIERY AND UNDERCLOTHING—ACCESSORIES OF WEARING APPAREL.

Hosiery of cotton, thread, wool, and silk cashmere, or of floss silk, pure or mixed. Elastic fabrics; knit goods. Made garments for men, women, and children; baby linen. Flannel goods and other woolen garments.
Corsets, cravats, gloves, gaiters, garters, suspenders, buttons, fans, screens, umbrellas, sunshades, canes, etc.

CLASS 36.—WEARING APPAREL FOR BOTH SEXES.

Men's clothes; women's clothes.
Hats and head-wear for both sexes: artificial flowers and feathers.
Wigs and hair-work.
Boots, shoes, etc.
Children's garments.
Special garments for different occupations.
Native costumes of different countries.

CLASS 37.—JEWELRY AND PRECIOUS STONES.

Jewelry in precious metals, carved, filigreed, adorned with precious stones, etc.
Plated and imitation jewelry.
Ornaments of jet, amber, coral, mother-of-pearl, steel, etc.
Diamonds, precious stones, pearls and imitations.

CLASS 38.—PORTABLE WEAPONS—HUNTING.

Defensive armor: cuirasses, helmets.
Blunt weapons: clubs, bludgeons, etc.
Side-arms: swords, sabers, bayonets, lances, axes and hunting knives.
Missile weapons: bows, cross-bows, etc.
Fire-arms: guns, rifles, pistols, revolvers.
Gunsmiths' accessory articles.
Solid or hollow projectiles, explosives. Percussion caps, primers, cartridges.
Hunting equipments: articles used in training dogs.
Articles used in fencing halls.

CLASS 39.—ARTICLES FOR TRAVELING AND CAMP EQUIPAGE.

Trunks, valises, saddle-bags, etc. Dressing and traveling cases, miscellaneous articles. Traveling rugs; cushions; headwear; waterproof garments; shod staffs; grapnel hooks; umbrellas.

Portable articles specially designed for travelers and scientific expeditions; imple-

Products of the art of washing ashes, refining precious metals, gold-beating, etc.

Products of the working of crude metals; castings, bells, commercial iron; special kinds of iron; sheet-iron and tin; plates for sheeting and constructions, etc.

Sheet-iron coated with zinc or lead, etc.; copper, lead and zinc sheets, etc.

Wrought metals: forge-work and other iron-work; wheels and tires; unwelded pipes, chains, etc.

Products of wire-drawing. Needles, pins; wire cables; lattices; wire gauzes; perforated iron.

Hardware, edge-tools, ironmongery, copper sheets, sheet-iron work, scrap iron and tinware.

Various wrought metals.

Class 42.—Products of Forest Growth and Forest Industries.

Specimens of forest species.

Wood for working, fuel and building purposes. Timber for ship-building; staves; split woods.

Cork; textile barks. Tanning, dyeing, scenting and resinous substances, etc.

Products of forest industries: dried wood and charcoal; potash in the raw state; articles manufactured by the cooper, the basket-maker, the maker of fine straw goods, wooden shoes, etc.

Class 43.—Products of Hunting.—Products of Fisheries, Apparatus and Instruments for Fishing, and for Gathering Fruits of Natural Growth.

Collections and drawings of land and amphibious animals, birds, eggs, fishes, cetacea, mollusks and crustacea.

Products of hunting: furs and skins, hair, bristles, feathers, down, horns, teeth, ivory, bones, shells, musks, castoreum, and similar products.

Products of fisheries: whale-oil, spermaceti, etc.; whalebone, ambergris, mollusk-shells, pearls, mother-of-pearl, sepia, purple, corals sponges, etc.

Products of fruit growth or of crops obtained without cultivation: mushrooms, truffles, wild fruits, lichens used in dyeing; food and fodder; fermented saps; Peruvian bark; useful barks and filaments, wax, resinous gums, raw India rubber, gutta-percha, etc.

Traps and snares; fishing lines and hooks, harpoons, nets, apparatus and bait for fishing.

Apparatus and instruments for gathering products obtained without cultivation.

Class 44.—Agricultural Products not Used for Food.

Textile materials: raw cotton, flax and hemp, scutched and unscutched; textile vegetable fibers of every kind; raw wool, washed and unwashed; silk-worm cocoons.

Various agricultural products employed in industry, pharmacy, and for domestic purposes; oleaginous plants, oils, wax, resins.

Leaf or manufactured tobacco. Touchwood. Tanning and dyeing substances.

Preserved fodder and substances specially intended for feeding animals.

Class 45.—Chemical and Pharmaceutical Products

Acids, alkalies, salts of all kinds, sea salts and products resulting from the treatment of mother-waters.

Various products of the chemical industries; wax and fatty substances; soaps and candles; resins, tars and derivative substances; essences and varnishes; glues and gelatines; printing inks; different coatings, blackings and waxings.

Raw materials used in pharmacy; simple and compound medicines.

Products of the India-rubber and gutta-percha industries; dyeing substances and colors.

Products derived from the treatment of mineral matters utilized for lighting. Refined petroleum.

CLASS 46.—CHEMICAL METHODS OF BLEACHING, DYEING, PRINTING AND FINISHING.

Specimens of threads and stuffs, bleached and dyed. Samples of dyeing preparations.

Specimens of printed or dyed linen and cotton prints, pure or mixed. Specimens of woolen prints, pure or mixed, combed or carded.

Specimens of silk prints, pure or mixed.

Specimens of printed felt or cloth carpet and of oil-cloths.

CLASS 47.—LEATHERS AND SKINS.

Raw materials used in the preparation of skins and leather.

Raw hides; salted hides. Tanned, curried, dressed or dyed leather. Varnished leather.

Morocco and sheepskins; skins grained, chamoied, tawed, dressed or dyed. Skins prepared for gloves. Parchments.

Articles of gut-work; gold-beaters' skins; bulls' sinews, etc.

SIXTH GROUP.—APPARATUS AND PROCESSES OF MECHANICAL INDUSTRIES—ELECTRICITY.

CLASS 48.—APPARATUS AND METHODS OF WORKING MINES AND OF METALLURGY.

Apparatus for exploration by borings, for artesian wells and for wells of large sections.

Models, plans and views of the works of mines and quarries. Works for obtaining the flow of mineral waters.

Machines and apparatus used for extracting ores, and for lowering and hoisting

Movable steam-engines for special purposes and horse-gins.
Fertilizers of organic or mineral origin.
Apparatus for the physical and the chemical study of soils.
Plans of methods of replanting, managing, and cultivating forests.
Apparatus used in forest work and forest industries.

CLASS 50.—APPARATUS AND METHODS USED IN AGRICULTURAL WORK AND FOOD INDUSTRIES.

Appliances for agricultural work; manufactories of artificial fertilizers, of drainage pipes, flour-mills, farina-mills, starch-mills, oil-mills, breweries, distilleries, sugar works, refineries, workshops for the preparation of textile materials, silk-worm nurseries, etc.

Appliances for the manufacture of alimentary products: kneading-machines and mechanical ovens for bakers; pastry and confectionery utensils.

Apparatus for the manufacture of doughs for food, sea-biscuit, etc. Machines for making chocolate. Apparatus for roasting coffee.

Preparation of ices and sherbets; manufacture and preservation of ice.

CLASS 51.—APPARATUS USED IN CHEMISTRY, PHARMACY, AND TANNING.

Laboratory utensils and apparatus; enameling lamps; blow-pipes.

Apparatus and instruments for industrial and commercial experiments.

Appliances and apparatus of the manufactories of chemical products: soaps and candles.

Appliances and methods of the manufacture of essences, varnishes, articles of india-rubber and gutta-percha.

Appliances of factories treating mineral substances used in lighting.

Appliances and methods of bleaching works.

Appliances for the preparation of pharmaceutical products.

Appliances of factories for tanning and dressing leather.

Appliances and methods of glass works, and manufactories of ceramic products.

CLASS 52.—MACHINES AND APPARATUS OF GENERAL MECHANICS.

Separate pieces of machinery. Bearings, rollers, slide-bars, eccentrics, gearings, connecting-rods, parallel motions and joints, pulleys, belts, transmissions by ropes, etc. Couplings, clutches, etc. Regulators and governors. Apparatus for greasing and oiling.

Counters and registers. Dynamometers, pressure-gauges, weighing-machines. Apparatus for measuring liquids and gases.

Machines used for moving heavy weights.

Hydraulic lifting machines: norias, pumps, tympans, hydraulic rams, etc.

Hydraulic motors: wheels, turbines, water-pressure engines.

Hydraulic presses.

Engines moved by steam: stationary engines, partially stationary engines, movable engines. Boilers, steam-generators, and accessory apparatus.

Apparatus for condensing vapors.

Engines run by other vapors than steam: by combined vapors.

Gas, hot-air, and compressed-air engines.

Apparatus for the transmission of power by water and by air.

Wind-mills and wind-vanes.

Balloons.

Cements and non-conducting preparations.

Class 53.—Machine Tools.

Turning lathes and machines for boring and planing, mortise-cutting machines, drilling-machines, cutting-presses, shaping-machines, tenoning-machines, punching-machines, tapping-machines, screw-cutting machines, riveting-machines, etc. Perforators. Various tools used in machine-shops.

Stones for sharpening, scraping, polishing, etc.

Tools, machines, and apparatus used for pressing, crushing, working up, stamping, and beating out, etc.

Machines for sawing and polishing hard stones, marbles, etc.

Special machine tools used in various industries.

Class 54.—Appliances and Methods of Spinning and Rope-Making

Appliances for hand-spinning. Separate pieces pertaining to the appliances of spinning-mills. Machines and apparatus used in the preparation and spinning of textile substances. Apparatus and methods used in the operations complementary to these: drawing, winding, twisting, and throwing; mechanical finishing. Apparatus for drying and determining the thickness and numbering the threads.

Appliances of rope-walks. Round cables, flat cables, tapering cables, ropes, twine, wire cables, cables with metal core, fuses, quick matches, etc.

Class 55.—Apparatus and Methods of Weaving.

Appliances used in preparatory operations for weaving: machines for warping, winding. *Lisages.*

Hand and mechanical looms for the manufacture of plain fabrics. Looms for the manufacture of figured and embroidered stuffs. Damask looms.

Looms for manufacturing carpets and tapestries.

Looms and machines for the manufacture of hoisery and net.

Appliances for lace-making. Appliances for making trimmings.

Upright looms and methods of spooling. Accessory apparatus: machines for fulling, calendering, embossing, watering, measuring, folding, etc.

Machines for pointing, sculpturing, reducing statues, engraving and engine-turning, etc.

Brick machines, tile machines; machines for making artificial stones, drawing out, compressing ceramic products. Kneaders, grinders, and other machines for making bricks, pipes, and pottery for buildings.

CLASS 58.—APPLIANCES AND METHODS OF PAPER MANUFACTURE, COLORING AND PRINTING.

Appliances and products of the manufacture of paper pulp of wood, straw, alfa, etc.

Methods and products of the bleaching of wood fibres.

Appliances for the manufacture of paper by vat and by machine.

Apparatus for pressing, glazing, watering, embossing, water-marking, and ruling paper. Machines for cutting, paring, and stamping paper, etc.

Appliances for bleaching, coloring, and finishing paper and tissues.

Appliances for printing paper-hangings and tissues. Machines for engraving printing rollers.

Appliances, apparatus and products for type foundries, stereotype plates, etc.

Machines and apparatus employed in printing, stereotyping, copper-plate printing, autography, lithography, engraving on copper, engraving on zinc, chromolithography, etc. Machines for setting up and distributing type. Printing of bank-notes, postage-stamps, etc.

CLASS 59.—MACHINES, INSTRUMENTS, AND METHODS USED IN VARIOUS OCCUPATIONS.

Coining-presses.

Machines used in the manufacture of buttons, pens, pins, letter-envelopes; machines for packing, making brushes and cards; manufacturing capsules; for fixing lead seals to merchandise; corking bottles, etc.

Tools and methods of manufacture of articles of clock-work, toys, inlaid work, basket-work, etc.

Machines for book-binding. Writing machines.

Appliances, instruments, and machines for the manufacture of tobacco.

CLASS 60.—CARRIAGE-MAKING, WHEELWRIGHTS' WORK, HARNESS-MAKING AND SADDLERY.

Separate parts of carriage-makers' and wheelwrights' work; wheels, tires, axles, hubs, iron-work, etc. Springs and various systems of hanging carriages.

Methods of harnessing. Brakes.

Products of the wheelwrights' work; wagons, carts, drays, vehicles for special purposes.

Products of carriage-building, carriages for hire, state carriages, private carriages, sedan chairs, litters, sleighs, etc., velocipedes.

Articles of harness and saddlery; pack-saddles, saddles, stretchers for conveying the wounded; bridles and harness for riding animals, beasts of burden and draught horses; stirrups, spurs, driving and riding whips.

CLASS 61.—RAILROAD APPLIANCES.

Separate parts: springs, buffers, brakes, etc.

Permanent way: rails, chairs, fish-plates, crossings, switches, turn-tables; buffers; water-cranes and water-tanks; optical and acoustic signals. Various kinds of safety apparatus, block system.

Fixed appliances for tramways.

Rolling-stock: passenger-cars, construction-cars, freight-cars, cattle-cars, locomotives, tenders.

Self-moving carriages and road engines.

Special machines and tools for shops of maintenance, repair, and the construction of appliances.

Appliances and machines for inclined planes and self-acting planes; models of engines, systems of traction and apparatus relating to railways.

Rolling-stock for tramways of various kinds.

Models, plans and drawings for depots, stations, car-houses, and other buildings necessary for the working of railroads.

CLASS 62.—ELECTRICITY.

Production of electricity: static electricity, piles and accessories, magneto-electrical and dynamo-electrical machines, accumulators.

Transmission of electricity: cables, wires, and accessories; lightning-rods.

Electrometry: apparatus for electrical measurements. Registers of electricity.

Applications of electricity: telegraphy, signals, telephony, microphony, photophony, electric light, electric motors, electrical locomotion, conveyance and distribution of force, transformers. Medical electricity, electro-chemistry. Electro-magnets and magnets, compasses. Electrical clock-work.

Various kinds of apparatus.

CLASS 63.—APPLIANCES AND METHODS OF CIVIL ENGINEERING, OF PUBLIC WORKS AND ARCHITECTURE.

Building materials, rocks, woods, metals, ornamental stones; limes, mortars, cements, artificial stones and concretes: roofing tiles, bricks, paving-tiles; slates, roofing-paper and felts for roofs.

Appliances and products of methods employed for the preservation of wood. Apparatus and instruments for testing building materials.

Appliances for earth-work; excavators. Apparatus used in work-yards. Tools and methods used by stone dressers and cutters, masons, carpenters, roofers, locksmiths, joiners, glaziers, plumbers, house-painters, etc.

Apparatus and methods for filtering water.

Apparatus intended for the prevention of infectious diseases; methods, materials and instruments for purifying, destroying germs, and disinfecting.

Apparatus and instruments for interring and destroying dead bodies in cemeteries and on battle-fields; cremation.

Plans, models, and documents of health offices, national, departmental, and municipal.

Appliances and methods of industrial and professional hygiene.

Plans, models, arrangement and furniture of hospitals, various asylums, houses of refuge, of retreat, insane asylums, infant asylums, etc.

Plans, models, specimens of civil and military ambulances.

Mineral waters and waters charged with natural or artificial gases.

CLASS 65.—NAVIGATION AND LIFE-SAVING.

Drawings and models of stocks, graving docks, floating docks, etc.

Drawings and models of vessels of all kinds used for river and sea navigation. Plans and models of systems of construction adopted in the merchant-service and in the navy. Torpedo-boats.

Ships' boats and small craft.

Appliances for rigging ships; cranes, capstans. Steam capstans. Steering gear. Equipment.

Flags and signals. Apparatus intended to prevent collision at sea. Buoys, beacons, etc.

Apparatus for swimming, diving and life-saving, practically exhibited; life-preservers, swimming-belts, etc.; diving-bells, nautiluses, diving-armor, etc. Submarine boats, appliances of maritime life-saving service; mortars for casting lines; life-boats, etc. Apparatus for life-saving in case of fire and other accidents.

Pleasure boats.

CLASS 66.—APPARATUS AND METHODS OF THE ART OF WAR.

Works of military engineering; fortifications.

Artillery, arms, gun-carriages, and projectiles of all kinds.

Equipment, clothing, and camp material.

Appliances for military transports.

Military topography and geography.

SEVENTH GROUP.—FOOD PRODUCTS.

CLASS 67.—CEREALS.—FARINACEOUS PRODUCTS WITH THEIR DERIVATIVES.

Wheat, rye, barley, rice, maize, millet, and other cereals in the grain, and when ground.

Hulled grain and oatmeal and grits.

Starch from potatoes, rice, lentils, etc., gluten.

Tapioca, sago, arrow-root, various starches, mixed farinaceous products.

Italian paste, semolino, vermicelli, maccaroni.

Alimentary preparations as substitutes for bread, nouilles, pap, pastry of domestic make.

CLASS 68.—PRODUCTS OF THE BAKERY AND PASTRY SHOP.

Various kinds of bread, with or without yeast; fancy bread and bread in shapes; compressed bread for traveling, military campaigns, etc.; sea biscuit.

Various kinds of pastry peculiar to each country. Gingerbread and dry cakes fit for preservation.

CLASS 69.—FAT SUBSTANCES USED FOR FOOD, MILK PRODUCTS AND EGGS.

Eatable fats and oils.
Fresh milk, preserved milk; salt and fresh butter; cheeses.
Eggs of all kinds.

CLASS 70.—MEATS AND FISHES.

Salt meats of every kind. Meats preserved by various processes. Meat and soup cakes. Hams and prepared meats.
Poultry and game.
Salt fish, packed fish, codfish, herrings, etc.; fish preserved in oil; sardines, pickled tunny-fish, etc.
Crustacea and shell-fish: Lobsters, shrimps, oysters; preserved oysters, anchovies, etc.

CLASS 71.—VEGETABLES AND FRUITS.

Tubers, potatoes, etc.
Dry farinaceous vegetables: beans, lentils, etc.
Green vegetables for cooking: cabbages, etc.
Vegetable roots: carrots, turnips, etc.
Vegetables used for seasoning: onions, garlic, etc.
Salads, gourds, pumpkins, melons, etc.
Vegetables preserved by various processes.
Fresh fruits; fruits dried and prepared; prunes, figs, raisins, etc.
Fruits preserved without sugar.

CLASS 72.—CONDIMENTS AND STIMULANTS; SUGAR AND PRODUCTS OF CONFECTIONERY.

Spices. Pepper, cinnamon, allspice, etc.
Table salt.
Vinegars.

EIGHTH GROUP—AGRICULTURE, CULTIVATION OF THE VINE, AND FISH CULTURE.

CLASS 73 *bis*.—AGRONOMY.—AGRICULTURAL STATISTICS.

Studies concerning the waters, the soils, the climates, and rural populations. Divisions of lands and cultivations.

Agricultural statistics: agrological, hydrographical, climacteric maps, agronomical maps. Tables, plans, models.

Agronomical stations; agricultural laboratories.

Agricultural syndicates, societies, and meetings.

Institutions of credit, charity, of protection for rural population; mortgage companies, agricultural banks, people's banks, co-operative insurance, savings banks, etc.

Legislative measures; rural code, special laws.

Official agricultural administration; works and publications. Agricultural missions.

CLASS 73 *ter*.—ORGANIZATION, METHODS, AND APPLIANCES OF AGRICULTURAL INSTRUCTION.

Plans, models, and programmes of the agricultural primary schools, agricultura orphan asylums, farming schools or apprentices' schools.

Methods and apparatus of instruction, fields for experimenting, etc.

Work done by pupils.

Plans and models of practical agricultural schools, of special schools of vine culture, horticulture, and forestry, etc.

Method and apparatus of instruction.

Work done by masters; specimens of work done by pupils.

Plans and models of national schools of agriculture, of agricultural academies. Veterinary schools. Schools of forestry. Agricultural high schools, agronomical institutes.

Methods and apparatus of instruction.

Work of professors, specimens of pupils' work.

CLASS 74.—SPECIMENS OF FARM IMPROVEMENTS AND AGRICULTURAL WORKS.

Models of farm buildings of various countries.

Designs of stables, cattle-houses, sheep-sheds and folds, pig-sties, and buildings for raising and fattening animals.

Appliances for stables, cattle-houses, kennels, etc.

Apparatus for preparing food for animals.

Agricultural machines in operation: steam plows, reapers, mowers, hay-makers, threshers, etc.

Designs of agricultural works: distilleries, sugar-mills, refineries, breweries, flour-mills, fecula and starch factories, silk-worm nurseries, cheese factories, dairies.

Presses for cider and oil.

Models of poultry-houses, pigeon-houses, pheasant-houses.

Apparatus for artificial hatching.

Models of kennels.

CLASS 75.—VINE CULTIVATION.

Models of buildings used in vine cultivation.

Apparatus used in the cultivation of the vine.

Appliances of wine vaults, cellars, and vats. Presses.

Processes and methods employed in fighting diseases of the vine.

Collections of vines.

CLASS 76.—USEFUL AND INJURIOUS INSECTS.

Bees, silk-worms, and other varieties of the bombyx.
Cochineal insects.
Apparatus used in the culture and keeping of bees and silk-worms.
Apparatus and methods used in the destruction of injurious insects.

CLASS 77.—FISH, CRUSTACEA, AND MOLLUSKS.

Useful aquatic animals in the live state.
Aquariums, methods of pisciculture.
Apparatus for rearing fish, mollusks, and leeches.

NINTH GROUP.—HORTICULTURE.

CLASS 78.—CONSERVATORIES AND HORTICULTURAL APPARATUS.

Gardeners', nurserymen's, and horticulturists' tools.
Apparatus for watering and keeping turf.
Large conservatories and their appurtenances. Room and window conservatories.
Aquariums for aquatic plants.
Fountains and apparatus for the ornamentation of gardens.

CLASS 79.—FLOWERS AND ORNAMENTAL PLANTS.

Species of plants and specimens of cultivation, exhibiting the characteristic types of the gardens of the natives of every country.

CLASS 80.—VEGETABLES.

Species of plants and specimens of cultivation, indicating the characteristic types of the kitchen-gardens of every country.

CLASS 81.—FRUITS AND FRUIT TREES.

Labor of women and children in factories. Incentives to labor, medals and prizes; skill of the industrial or agricultural laborer, and pay according to length of service.

SECTION II.—*Share in profits, productive co-operative associations.*

Share in the profits; different systems adopted; mode of employment of the product of this participation; regulations and by-laws; forms of accounts; farming on shares.

Workmen's productive co-operating societies; different systems adopted for constituting the board of managers, interest on the capital, and remuneration of the assistant workmen.

SECTION III.—*Trade syndicates.*

Trade syndicates; masters' syndicate societies; workmens' syndicate societies; trades unions; diverse co-operative institutions.

Agricultural syndicates.

Stoppages; strikes; obligatory and voluntary arbitration.

Boards of arbitration; labor exchanges; hiring of workmen and of employés.

Learned societies, trade or other, founded for the study of questions of social economy in industrial centres; by-laws and reports of these societies.

SECTION IV.—*Apprenticeship.*

Contract of apprenticeship; technical instruction given in the workshops or in schools and classes founded by the factory, by a committee of employers, or by the workmen themselves. Housekeeping schools; mill and agricultural orphan asylums.

Establishments intended for children morally abandoned.

Employers' societies for apprentices.

Instruction to intended workmen and intended employés on economical, social, and manufacturing subjects, and on the practical working of provident institutions.

SECTION V.—*Mutual aid societies.*

Mutual aid societies; medical attendance; medicines; indemnities for stoppages; home relief; dispensaries; hospital treatment; care in convalescence; stay at watering places; funeral expenses.

Retiring pensions paid by mutual aid societies; privileges granted to incorporated mutual aid societies in permitting them to contract life insurance on their members collectively.

Admission of women; relief in cases of childbirth; statistical tables of sickness.

SECTION VI.—*Superannuation funds and annuities.*

National banks of superannuation.

Pensions or annuities, immediate or deferred, established by the state, by life insurance companies, or by private individuals.

SECTION VII.—*Accident insurance—Life insurance.*

Individual or collective insurance against accident for the benefit of the workman in case of incapacity for labor, temporary or permanent, from wounds or maiming, or in case of death. Stoppages agreed upon for this purpose from the wages of the workman; charges made for the same object on the general expenses or on the profits.

Diverse systems to insure the workman against accident by the state, by private

stock or mutual companies, by factory syndicates incorporated for this purpose, and according to the terms of the law.

Insurance by companies for the benefit of the employer against his civil responsibility in case of accident. Life insurance in case of death, mixed, for a fixed term, deferred, with various combinations, by the state, by insurance syndicates, or companies. Premiums and half premiums of insurance paid by the workmen, by the employers, or by societies created for this purpose.

Tables of mortality.

Statistics of accidents of every kind.

Diverse insurances: Fire· hail; diseases among domestic animals.

SECTION VIII.—*Savings.*

Savings banks, national and postal.

School savings banks.

Savings banks supervised by the state.

Savings societies for the purchase of goods in common, wholesale.

Different systems of incentives to economy: Rates of interest; allowances; adoption of a higher rate of interest for small deposits. Different systems of temporary deposit: A definitive investment of individual or collective savings of workmen and employés (deposit or running account in the safe of the factory, deposit in a public bank, obligatory or voluntary investment of the workman's savings in interest-bearing bonds, or in shares of the factory). Ascertainment of the capital of the workman during his stay in the factory, by means of the capitalization at compound interest, as ascertained by his hand-book, of his share in the profits; of the dividends of a food co-operative association; of the allowances of the employer, with or without retention of wages.

SECTION IX.—*Food co-operative associations.*

Systems of sale at current price or at cost, price of food, of clothing, and of articles of housekeeping.

Kitchens and refectories. Canteens.

Economic bakeries.

Regulations, by-laws, accounts, and budgets.

Renting to the tenant workman at current rates, with credit to him, on his savings or superannuation book, of the difference between the current rent and the actual cost.

Incentives to build workmen's houses by loans at reduced rates made by the state or city, or by reduction of taxes, or other advantages.

SECTION XII.—*Workmen's clubs; recreations, sports.*

Workmen's clubs. *Workingmen's clubs.* Construction, organization. Libraries. Works of art, classes, lectures, games, recreations, drills, singing-schools, bands, shooting, and gymnastics.

SECTION XIII.—*Social hygiene.*

Laws, regulations, and by-laws relating to social hygiene.

Alcoholism. Means employed to counteract it. Statistics and documents. Temperance societies and establishments depending upon them. Gothensburg system. Refreshment rooms. Protection of young children, of apprentices, and of women in childbirth.

Baths and laundries; reservoirs.

Health and safety of workshops.

Precautions against mill accidents. Regulations of the mill.

SECTION XIV.—*Various institutions created by employers for the benefit of their employés.*

Presents; interest-bearing shares; participation in profits.

Allowances in the general expenses, or charges on the profits in any way, for relief and provident institutions, and for institutions for savings, for education and instruction.

Technical instruction given in the factory. Aid associations of mines and factories, with or without retention of wages. Infirmaries: Relief to the sick, the wounded, to women in childbirth, to widows, to orphans.

Factory workshops.

Marriage portions for young workwomen.

Superannuation funds and asylums for old or maimed men. Accident and life insurance charged to general expenses, with or without retention of wages.

Special savings banks of mills and factories. Co-operative stores and canteens. Co-operative restaurants.

Advances to workmen without interest.

Free lodgings, or at reduced rates.

Free warming. Cheap renting or sale by the employer to the workman of land for building or cultivating. Advances made specially for this purpose.

Institutions specially applicable to rural labor. Rights of custom. Medical and hospital relief to agricultural laborers.

Establishments which in general may have made the greatest and most successful efforts both to ameliorate the material and moral condition of their workmen, and to establish on a better footing the community of interest among the different agents of production.

SECTION XV.—*Large and small factories.—Large and small farms.*

Statistics and documents relating to the concentration of industry in large establishments. Small workshops: efforts to increase them. Domestic industries and mode of applying power to them. Woman's work in the household.

Union of factory and agricultural labor.

Large and small farms.

Emigration and return. Hospital stations. Receipts and expenses of a workman's family.

SECTION XVI.

Economic intervention of the state.

GENERAL DIRECTION OF THE MANAGEMENT.—FOREIGN SECTIONS.

MISCELLANEOUS INFORMATION.

I.

The Exposition of 1889 at Paris will be universal and international; that is to say, it will receive the agricultural, industrial, and artistic products of all countries.

It will occupy, in one enclosure, and according to the plan annexed to the present memorandum:

(1) On the left bank of the Seine, the Champ de Mars, and the shores of the Seine, the Esplanade des Invalides, and the part of the Quai d'Orsay included between the Esplanade and the Champ de Mars.

(2) On the right bank of the Seine, the Park and certain disposable parts of the Palace of the Trocadéro.

The Bridge of Jena, which connects the grounds of the Trocadéro with the Champ de Mars, will be included in the enclosure of the Exposition.

The plan of the Exposition comprises four fundamental divisions:

I. CHAMP DE MARS.

I. PALACE OF FINE ARTS (A).

GROUP I.—*Works of art.*

4. PALACE OF MACHINES (D).

GROUP VI.—*Tools and processes of the mechanical arts, electricity.*

(The space reserved for the United States is shown on the plan of the Palace of Machines.)

II. QUAI D'ORSAY.

1. PALACE OF FOOD PRODUCTS (E).

GROUP VII.—*Food products.*

This building, with stories, will contain food products divided by nationalities and by classes.

2. GALLERIES OF AGRICULTURE (G).

GROUP VIII.—*Agriculture, viticulture, and pisciculture.*

These galleries will be divided into national compartments.

III. ESPLANADE DES INVALIDS.

(1). Open spaces planted with trees, reserved for agriculture, supplementarily (Group VIII).

(2) Diverse exhibitions—French colonies and protected countries—Special exhibitions of the French ministries—Social Economy—Hygiene.

IV. TROCADERO.

INTERNATIONAL EXHIBITION OF HORTICULTURE AND ARBORICULTURE.

A. GROUP IX.—*Horticulture.*

The space available for the different groups, for foreigners and for Frenchmen, has been calculated according to the statistics of preceding expositions.

The expositions of 1867 and 1878 at Paris had both admitted the construction on the Champ de Mars of a central building, the galleries of which, arranged either circularly or in a straight line, allowed the installation of foreign and French products in such a manner that the visitor could, at his pleasure, examine all the products of the same group from different countries, or all the products of the different groups from the same country.

This organization required the allotment of a special, well-defined compartment to each country. It was successful in 1867, although the banishment of the French and foreign agricultural products to a distant hall was an infraction of the rule adopted. In 1878 they tried to repeat the system of 1867, but the abundance of the products admitted made the disposable covered space in the central building of the Champ de Mars insufficient. It became necessary, therefore, to adopt a scheme without any method and construct a number of annexes.

The plans for 1889 have in the arrangement adopted substituted a species of order methodically directed for the former compact order of the arrangement of products.

II.

FREE SPACE.

In conformity with the traditional hospitality of the International Expositions of 1855, 1867, 1878, and 1881, which have been held in Paris, the foreign and the French exhibitors will have no rent to pay for the sites of their exhibits.

EXPENSES AT THE CHARGE OF THE EXHIBITORS.

The French administration will furnish covered sites for all articles in the groups of Fine Arts, Liberal Arts, Industrial, Mechanical, and Agricultural, which will not bear exposure to the weather. The exhibitors are to pay, either individually or collectively, the whole of the expenses of the subdivision, installation, and decoration of these sites, including furnishing, arranging, fitting-up, and decorating the separate compartments, awnings or false ceilings, glass cases and furniture for holding the exhibits, all according to [plans adopted by the administration. They are also to pay for constructing the floor of the exhibition rooms, the administration paying only for that of the passages, in accordance with Article 16 of the General Regulations. As regards the floor especially, the administration is at liberty, with a view to a more economical and uniform work, to construct all the floors, and look to the exhibitors to pay the amounts due from them. They will also be pecuniarily responsible for all damage done by themselves or by their workmen.

KEEPERS.

Exhibitors must include in their general expenses of installation the wages and uniform of the men charged with cleaning and watching (private) the rooms.

SECTION OF MACHINES.

Foreign and French boiler-makers and machine-builders will be permitted to send in proposals for supplying the motive power which the administration is bound to furnish to put the machines exhibited in motion, according to Articles 34 of the General Regulations. The general conditions for supplying this power by steam are already settled.

EXHIBITION OF HORTICULTURE.

A special regulation informs the public how the permanent and temporary exhibits of the group of horticulture are organized, and under what conditions certain exhibitors can have the use of greenhouses, either hot or cold.

EXHIBITION OF LIVING ANIMALS.

PATENTED INVENTIONS.

The superior administration will take all necessary measures to assure, under the same conditions as in preceding expositions, the protection of patented inventions.

CATALOGUE.

There will be prepared in French a methodical and complete catalogue of the products of all nations, indicating the positions they occupy in the buildings, the parks, and the gardens, as well as the names of the exhibitors.

Each nation will have the right, in addition, to make at its own expense, but in its own language only, a special catalogue of the articles exhibited in its sections, conformably to the list of prices which will be prepared by the administration.

Examined and forwarded.

GEORGES BERGER,
Director-General of Management.

Examined and approved,
The *Minister of Commerce and of Industry,*
Commissioner-General.
By LUCIEN DAUTRESME.

APPENDIX C.

THE FRENCH GENERAL COMMISSION.

FRENCH ADMINISTRATION.

Mr. Tirard, President of the Council, Minister of Industry and Commerce, and for the Colonies	Commissioner-General.
Messrs. Alphand.	Director-General of Works.
Ch. Garnier	Consulting Architect.
Contamin	Chief Engineer.
Dutert	Architect Machinery Hall.
Bouvard	Architect Industrial Sections and Central Dome.
Formige	Architect Fine Arts and Liberal Arts.
Bechmann	Chief Engineer of Water Service.
Laforcade	Chief of Gardens.
De Mallevoue	Secretary to the Direction.
Délions	Chief Secretary of Technical Service.
Georges Berger	Director-General of Management.
Thurneyssen	Secretary to the Direction.

APPENDIX D.

ESTIMATED AND ACTUAL COST OF BUILDINGS, OPERATIONS, ETC.

Comparative statement of the estimated and actual cost of buildings, etc., Paris Exposition, 1889.

Construction or Operation.	Estimated cost.	Actual cost.	Excess.	Reduction.
Fine Arts and Liberal Arts Buildings	$1,274,497	$1,352,951	$78,454	.....
Machinery Hall—Construction only	1,446,677	1,502,779	56,102	.....
Industrial Sections	1,157,281	1,177,127	19,846	.....
Drainage	104,969	104,969	.....	.....
Reserved Fund for Construction	16,565	19,182	2,617	.....
Horticultural Grounds	60,000	60,000	.....	.....
Agricultural Galleries	120,000	120,000	.....	.....
Parks and Gardens	616,531	406,531	.....	$210,000
Offices, Police Bureaus, etc	91,750	91,750	.....	.....
Inclosures	90,000	90,000	.....	.....
Improvements, etc., left bank of Seine	16,000	5,134	.....	10,866
Foot Bridges	40,000	40,000	.....	.....
Water and Gas	120,000	120,000	.....	.....
Roads and Restoration of Grounds	72,652	72,652	.....	.....
Water-Closets	35,000	.....	.....	35,000
Expenditures in Machinery Hall	963,044	616,413	.....	346,631
General Reserve Fund	200,975	.....	.....	200,975
Mechanical Service	18,600	18,600	.....	.....
Horticultural Exposition	13,200	13,200	.....	.....
Social Economy Section	15,120	15,120	.....	.....
	6,472,861	5,826,408	157,019	803,472

The actual expenditure, therefore, was $646,453 less than the estimated cost.

APPENDIX E.

STATISTICS OF ADMISSION.

PARIS EXPOSITION OF 1889.

Receipts from tickets of admission in 1867–1878–1889.

Month.	Gross receipts.				
	1867.	1878.	Increase of 1878 over 1867.	1889.	Increase of 1889 over 1878.
May	1,224,184	1,278,800	54,676	2,610,813	1,331,953
June	1,357,937	1,954,103	596,166	4,338,869	2,384,766
July	1,264,358	1,823,176	558,818	4,544,196	2,721,020
August	1,276,019	1,959,394	683,315	4,977,092	3,017,758
September	1,328,196	2,720,595	1,392,399	5,246,704	2,526,109
October	1,729,226	2,303,403	574,177	4,820,869	2,517,466
November	227,289	584,376	357,087	1,610,810	1,026,434
Total	8,407,209	12,623,847	4,216,638	28,149,353	15,525,506

[redacted]

APPENDIX F.

RESTAURANTS, CONCESSIONS, AND REGULATIONS.

MEMORANDUM ON THE SPECIAL CLAUSES AND CONDITIONS RELATING TO RESTAURANTS, CAFÉS, BEER-HALLS, BUFFETS, ETC.

ARTICLE 1.—OBJECT OF THE ENTERPRISE.

The enterprise of which these presents regulate the conditions, has for object the construction and management ("exploitation"), during the whole Exposition, of * * *

FIRST PART.

ART. 2.—CONSTRUCTION AND INSTALLATION—LOCALITY.

The locality leased for the establishment of ——— is indicated on the annexed plan. It has a total area of ———

ART. 3.—CONSTRUCTION.

The construction of the building and the arrangement of the dependencies shall be executed at the expense of the lessee, who shall comply with all the conditions imposed upon builders in the Exposition. The plans must be submitted for the approval of the Director General of Works.

The building may be constructed either in wood or masonry, at the choice of the lessee; but its appearance must be appropriate and elegant.

ART. 4.—FURNACES AND KITCHENS.

The furnaces, kitchens, and dependencies shall be so arranged as not to offend either sight or smell, or incommode exhibitors or visitors.

ART. 5.—ESTABLISHMENT OF FREE WATER-CLOSETS IN THE INTERIOR OF THE BUILDINGS.

The lessee shall have the right to establish free water-closets in the interior of his establishment. But he cannot do so without making special request of the Director General of Works, and conforming in their construction to all the conditions which may be prescribed upon this subject.

ART. 6.—USE OF THE CONCEDED SPACE.

The lessee may place chairs and tables within the circumference of his concession. But this permission may be limited or even withdrawn by the administration if abuses or inconvenience to visitors should result.

ART. 7.—FURNITURE, CHAIRS, BENCHES.

All the furniture belonging to the lessee, and especially that placed outside of his building, must be marked with his initials in clear and legible letters.

The lessee can under no pretext whatever employ for his own use the material (benches, chairs, etc.) belonging or loaned to the administration.

SECOND PART.

ART. 8.—USE—CHARACTER OF THE USE.

The lessee can make use of his concession only during the daily hours while the Exposition remains open, and within the space conceded. This rule is absolute.

ART. 9.—TARIFF OF PRICES.

He must submit for the approval of the Director General of Management the tariff of the principal articles of consumption, and also hang up in his establishment, in a conspicuous place, this tariff approved.

ART. 10.—ADMISSION OF EMPLOYÉS.

The lessee shall have the right of gratuitous admission for the employés necessary to the service of his establishment, but he must prepare a list of names, and submit it to the Director-General of Management. This list shall be deposited in the general office of the management, and be always visible.

The entrance of the employés shall be by the gates, and at fixed hours. It shall be by tickets, which shall be given up at the indicated turnstile. As soon as they shall have been counted and examined, they shall be returned the same day to the lessee, to be employed anew.

The lessee shall be responsible for frauds which may be committed in the employment of these tickets, but without prejudice to such measures as may be taken in

THIRD PART.

ART. 14.—ADDITIONAL DISPOSITIONS—RENT.

The rent to be paid shall depend upon the number of paying visitors admitted to all parts of the Exposition. This number shall be ascertained from the accounts of the General Direction of Finance. It shall not include the visitors admitted by season tickets.

The rent is placed at ——— per 1,000 visitors.

In the monthly account of rent, fractions of the number of visitors below 1,000 shall not be counted.

Such fractions shall be carried forward to the next month.

In stating the final account for settlement, all fractions of 1,000 shall be counted as 1,000.

ART. 15.—TIMES OF PAYMENT.

The lessee must pay into the treasury on the 15th of each month the amount of his rent for the preceding month.

He must at the same date also pay his rent for water, gas, electricity, care of parks, and, in a word, for all the expenses properly chargeable to him.

ART. 16.—CONSEQUENCES OF THE WITHDRAWAL OF THE LICENSE.

Whenever in consequence of a gross violation of the clauses of the present agreement, or of the memorandum of charges hereto annexed, the withdrawal of the license shall have been ordered, the administration may dispose of the leased premises, and even proceed to the demolition of the buildings.

ART. 17.—SECURITY.

To guaranty the proper execution of his agreement, Mr. ——— is bound to deposit in the Caisse des Depots et Consignations, a security of ———. This security shall be in money, or in French bonds; if in bonds, the owner shall be entitled to the interest; if in money, he shall be entitled to interest at 3 per cent. after sixty days.

The guaranty must be paid in within eight days after signing the present agreement.

The guaranty shall be returned within six months after the closing of the Exposition on the statement of the Directors-General of Works and of Management that the lessee has complied with all his obligations to the administration.

ART. 18.—COMPETITION—NUMBER OF ESTABLISHMENTS.

The Minister of Commerce and of Industry, Commissioner-General, reserves the absolute right to license as many beer-halls, restaurants, cafés, or other establishments as shall appear to him to be desirable.

Consequently the lessee cannot under any circumstances, or on any pretext, reclaim an indemnity either from the administration or from other contractors or lessees on account of competition.

ART. 19.—MEMORANDUM OF SPECIAL CHARGES IMPOSED UPON LESSEES IN THE PARKS AND GARDENS.

The lessee is also liable to the clauses and conditions imposed upon exhibitors and lessees permitted to build in the parks and gardens and in the galleries of the palace which were approved by the Minister of Commerce and Industry at the date of ———.

APPENDIX G.

FOREIGN COUNTRIES, APPROPRIATIONS, SPACE, ETC.

Statement of countries represented at Paris Exposition, 1889, showing amount of Appropriation, Space, etc.

[Taken from report on Paris Exposition of 1889, by E. T. Jeffery, of Chicago, Ill.]

Country.	How represented.	Space occupied.	Amount of funds.	Remarks.
		Sq. feet.		
Argentine Republic	Officially	32,292	$1,000,000	Special building.
Austria-Hungary	Unofficially.	37,674	35,000	Private money.
Belgium	do	139,932	120,000	
Bolivia	Officially	8,611	60,000	Special building divided with United States of Colombia.
Brazil	Unofficially.	*4,305 †8,611	200,000	
Chili	Officially	861		Special building.
China	Unofficially.	3,229		do.
Denmark	do	5,920	28,000	
Ecuador	Officially	1,076	30,000	Private money.
Egypt	Unofficially.	32,292	24,000	Including "Street of Cairo."

[redacted]

Statement of countries represented at Paris Exposition, 1889, etc.—Continued.

Country.	How represented.	Space occupied.	Amount of funds.	Remarks.
		Sq. feet.		
Norway	Officially	13,923	25,000	
Paraguay				
Persia	do	4,036		
Portugal	Unofficially.	21,514	100,000	Special building.
Peru	do			
Roumania	do	12,120	100,000	
Russia	do	34,444		
Salvador	Officially	1,162		Special building.
San Marino	do	2,475		do.
Spain and colonies	Unofficially.	42,367	145,000	do.
San Domingo	Officially	2,152	10,000	do.
Servia	do	6,027	44,000	
Siam	do	2,691		
Sweden				
Switzerland	Officially	69,966	91,000	Unknown amounts voted by the cantons.
South African Republic	do	2,152	16,000	
United States	do	113,000	250,000	
United States of Colombia	do	8,611		See Bolivia.
Uruguay				
Venezuela	do	4,843		

APPENDIX H.

EXPENDITURES IN PARIS OF FOREIGN COMMISSIONS.

Expenditures of foreign commissions in Paris during the Exposition of 1889.

Countries.	Amount.	Countries.	Amount.
Argentine Republic	[1]$800,000	Luxembourg	2,500
Austria-Hungary	[2]31,664	Mexico	[11]1,000,000
Belgium	[3]150,540	Monaco	.....
Bolivia	[4]31,073	Morocco	[12]30,000
Brazil	[5]142,820	New Zealand	20,000
Chili	[6]65,330	Nicaragua	12,000
China	9,650	Norway	27,000
Colombia	[7]2,000	Paraguay	[13]40,000
Denmark	30,000	Persia	10,000
Domingo, San	13,510	Portugal	200,000
Egypt	[8]80,000	Russia	33,735
Ecuador	12,000	San Salvador	12,000
Great Britain	[9]140,000	San Marino	7,000
Good Hope, Cape of	.....	Siam[14]	.....
Greece	22,000	South Africa	.....

[redacted]

APPENDIX I.

CIRCULARS, FORMS, AND REGULATIONS.

(A) ANTERIOR TO EXPOSITION.

CIRCULAR No. I.

PARIS UNIVERSAL EXPOSITION OF 1889.

OFFICE OF THE UNITED STATES COMMISSION, WASHINGTON BUILDING,
No. 1 BROADWAY, NEW YORK, N. Y.

[WILLIAM B. FRANKLIN, Commissioner-General; SOMERVILLE P. TUCK, Assistant Commissioner-General.]

JULY 25, 1888.

1. The Universal Exposition of 1889, at Paris, will open the 5th of May, and close the 31st of October, 1889.

2. An official regulation of the French management provides that exhibits will be received from January 1, 1889, up to March 31 following.

3. There will be no charge for space occupied by exhibitors.

4. As it is the intention of the United States Government, in participating in this Exposition, to demonstrate the merit and comparative excellence of our products and manufactures, the United States Commission will forward, *free of freight between New York and the Exposition, going and returning*, all articles received for exhibit.

5. In general no more than one specimen of an article of manufacture will be exhibited, but the Commission reserves the right to admit others; the cost of additional freight to be borne by the exhibitor at the discretion of the Commission.

6. Show-cases, counters, shelving, and platforms must be paid for by exhibitors, as well as the cost of unpacking and repacking their goods, and storage of empty cases.

7. Exhibitors who are unable to go to Paris or to send representatives will have their goods installed and cared for free of cost, except as previously specified.

8. Due notice will be given of the warehouses or steamship lines in New York to which goods must be consigned.

9. There will be no duties to pay except on those goods sold or consumed.

10. The United States Commission will take precautions for the preservation of all objects exhibited, but will not be liable for loss or damage of any kind, either in transportation, storage or while on exhibition. Insurance is at the option of the exhibitors and at their cost.

11. Detonating matters, fulminates, and all articles considered dangerous are excluded.

12. Spirits or alcohols, oils, essences, corrosive materials, and all articles of any kind that would damage other exhibits or incommode the public, will only be received if contained in vessels of moderate dimensions and of sufficient strength to secure them against accident.

13. Primers, percussion caps, chemical matches, and other similar articles will only be received in the shape of "dummies," without inflammable material.

14. The United States Commission reserves the right to order the removal of any article which, in its nature or appearance, is hurtful to or incompatible with the purposes of the Exposition.

15. The French Regulations state that all objects exhibited will be *protected against piracy of invention or design.*

16. A limited amount of steam, gas, and motive power will be supplied free of cost; pulleys and belting must be furnished by exhibitors, who must also bear the cost of all special fittings and work.

17. Exhibitors of apparatus requiring the use of water, gas, or steam must state in their applications for space the quantity of each required.

18. Applicants for space desiring to erect show-cases, counters, or partitions must furnish a scale-drawing showing clearly the elevations and ground-plans; especially indicating the sides of the cases intended to be open for inspection.

19. No article may be withdrawn before the close of the Exposition, without the special consent of this Commission.

20. All articles will be exhibited in the name of the person who signed the application for space.

21. Exhibitors are permitted to mention, with their own names, those of their assistants of all kinds and grades who have contributed to the merits of the exhibits.

22. Exhibitors are expressly requested to indicate the selling prices of the articles exhibited by them, so as to facilitate the work of the juries and inform visitors.

23. The official statement of the nine Groups of the Exposition and the classes thereunder will be furnished upon request.

24. *Blank applications for space will be furnished on application. When the allotment of space is definitely made, each exhibitor will be notified and furnished with a permit for the space assigned.*

25. All communications must be addressed to the United States Commission; the

CIRCULAR No. 3.

PARIS UNIVERSAL EXPOSITION OF 1889.

OFFICE OF THE UNITED STATES COMMISSION, WASHINGTON BUILDING, No. 1 BROADWAY, NEW YORK, N. Y.

[WILLIAM B. FRANKLIN, Commissioner-General; SOMERVILLE P. TUCK, Assistant Commissioner-General.]

GROUP I.—WORKS OF ART.

OCTOBER 25, 1888.

1. This Group consists of the following classes:

CLASS I.—*Oil paintings:* Paintings on canvas, panels, and various grounds.

CLASS II.—*Paintings of different kinds and Drawings:* Miniatures; paintings in water-colors; pastel and drawings of all kinds; paintings on enamel, earthenware, and porcelain; cartoons for stained-glass windows and frescoes.

CLASS III.—*Sculpture and Engravings on Medals:* Statuary, bas-relief, repoussé work and chiselled work, medals, cameos, engraved stones, inlaid enamel work.

CLASS IV.—*Architectural Drawings and Models:* Studies and fragments; representations and plans of buildings; restorations from ruins or documents.

CLASS V.—*Engravings and Lithographs:* Engraving in black; polychromatic engravings. Lithographs in black, in chalk, and with brush; chromo-lithography.

2. The only persons entitled to exhibit are American citizens, whether residing in the United States or abroad.

3. *Applicants for space desiring to make exhibits in any one of the above classes are requested to fill out the inclosed blank and return it without delay to this Commission at the above address.*

4. Artists residing in the United States must have their exhibits in New York by February 15, 1889, at the very latest. Exhibitors residing in Europe must have their exhibits at Paris by March 20, 1889. There will be absolutely no extension of time, and no exhibits will be received after the specified dates. If it be found necessary to fix earlier dates than those named, due notice thereof will be given.

5. A jury of artists will be formed for the purpose of examining all works submitted for exhibition. No article will be admitted for exhibit unless favorably passed upon by this special jury—representing so far as possible the five classes of this Group—which will exclude all works that would not reflect credit on the United States Exhibit.

6. Due notice will be given of the names of the members of this jury, one section of which will sit in New York, and the other in Paris; their decisions will be subject to revision by this Commission.

7. All pictures, whether round or oval, should be placed in square frames. Excessive breadth in frames or projecting moldings should be avoided.

8. There shall be pasted upon the back of each picture-frame, and upon the bottom of other articles, a label, plainly written, giving the title and the name and address of the exhibitor. A duplicate of this label must be pasted upon the case containing the picture or other article.

9. Exhibitors are assured that the utmost care will be observed in handling their works, that they may suffer no damage.

10. The names and addresses of the agents appointed to receive exhibits in New York and Paris will be made known hereafter, together with the location of the depot in each city to which all articles must be sent for examination by the jury.

11. Intending exhibitors must prepay the cost of transportation from place of residence to the depot. Proposed exhibits rejected by the jury will be returned to owners at their expense. Upon those accepted for exhibit this Commission will

pay all expenses, including boxing, cataloguing, transportation from depot to Exposition Building, and return to residence of owner. Insurance to a reasonable amount will also be paid; the owners of exhibits may effect additional insurance at their own cost, if they desire.

THE ATTENTION OF INTENDING EXHIBITORS IS CALLED TO THE FOLLOWING:

[I.—Extracts from the French official regulations as to this Group.]

12. Only works of art executed since 1878 can be exhibited.

13. Copies, even those which reproduce a work in a style differing from the original, are not admitted. Unframed pictures and drawing and statuary in unbaked clay are also inadmissible, as well as *engravings produced by industrial processes.*

14. The Ministre des Beaux Arts and the French Administration will not correspond directly with artists, whose works will only be admitted through the Commission of the country of their citizenship, which alone can receive and return exhibits.

15. A methodical and complete catalogue in the French language will be made by the Exposition authorities. Three lines at most will be given each exhibitor, for the mention of his full name, place of birth, names of his masters, and the recompenses which he has received. Two additional lines at most will be given him for the name and summary description of each picture that he exhibits.

16. The Commission of each nation has the right to make, at its own expense, but only in its own language, a special catalogue of the works exhibited in its section.

17. Artists exhibiting will have the right to a permanent and gratuitous ticket of entrance during the whole period of the Exposition.

18. No exhibits may be drawn, copied, or reproduced in any form whatever without the authorization of the exhibitor, approved by the Director of this Group.

19. Regulations will hereafter be made as to the number and nature of the prizes to be awarded, also as to the constitution of the international jury charged with the distribution of these prizes. Artists who become members of this jury are excluded from competition for awards.

20. No exhibit may be withdrawn before the close of the Exposition without the special authorization of the Director of this Group and the Director-General of the

31. No article may be withdrawn before the close of the Exposition without the special consent of this Commission.

32. All articles will be exhibited in the name of the person who signed the application for space.

33. Exhibitors are expressly requested to indicate the selling prices of the articles exhibited by them, so as to facilitate the work of the juries and inform visitors.

34. Blank applications for space will be furnished on demand. When the allotment of space is definitely made, each exhibitor will be notified and furnished with a permit for the space assigned.

35. All communications must be addressed to the United States Commission; the French Administration will not correspond with foreign exhibitors.

WILLIAM B. FRANKLIN,
Commissioner-General.
SOMERVILLE P. TUCK,
Assistant Commissioner-General.

CIRCULAR No. 4.

UNITED STATES COMMISSION TO THE PARIS EXPOSITION OF 1889.

[WILLIAM B. FRANKLIN, Commissioner-General; SOMERVILLE P. TUCK, Assistant-Commissioner-General.]

Washington Building, No. 1 Broadway, New York, N. Y.

[Paris Offices, 27 Avenue de la Bourdonnais. Cable addresses, New York, "Universal"; Paris, "Uscom."]

NEW YORK, *October* 28, 1888.

SIR: Please find inclosed herewith:

(1) Copy of the joint resolution of Congress accepting the invitation of the French Republic to take part in an International Exposition to be held in Paris in 1889.

(2) Newspaper cutting, giving some details of the project and a summary description of the Exposition buildings and various preliminary arrangements.

(3) Circular No. 1, containing an abstract of the official regulations of the French management, together with those established by the United States Commission.

(4) Blank application form for space to exhibit.

(5) Translation of the general classification, comprising the Nine Groups and their subdivisions.

Your attention is particularly called to Group II of the latter, devoted to all exhibits that come under the classification of Education and Instruction, and Apparatus and Processes used in the Liberal Arts.

At the Paris Exposition of 1878 the international jury made one hundred and fifteen awards to educational exhibitors in the United States section. This placed us at the head of foreign exhibits, and second only to France in the number of awards received by each country.

As it is the desire of this Commission to make the educational exhibit of 1889 equally creditable, and with your co-operation to surpass the satisfactory showing of all former expositions, we ask you to do everything in your power to advance the interests of this group, either by making application to exhibit in your own behalf, or by placing these circulars in the hands of others who are likely to apply for exhibition space in this department.

Awaiting your early reply, we are, sir, your obedient servants,

WILLIAM B. FRANKLIN,
United States Commissioner-General.
SOMERVILLE P. TUCK,
Assistant United States Commissioner-General.

[Form 38.]

CIRCULAR No. 5.

UNITED STATES COMMISSION TO THE PARIS EXHIBITION OF 1889.

[WILLIAM B. FRANKLIN, Commissioner-General; SOMERVILLE P. TUCK, Assistant-Commissioner-General.]

Washington Building, No. 1 Broadway, New York, N. Y.

[Paris Offices, 27 Avenue de la Bourdonnais. Cable addresses, New York, "Universal"; Paris, "Uscom."]

NEW YORK, *December*, 1888.

SIR: In order that a statistical chart of the higher educational institutions in the United States may be prepared for the Paris Universal Exposition of 1889, and with the hope that you will assist in perfecting the exhibit in the Educational Group, you are respectfully requested to fill out the inclosed blank and return it to the above address at your earliest convenience.

I am, sir, your obedient servant,

_____ _____,

Assistant Commissioner-General.

[Form 45.]

CIRCULAR No. 6.

PARIS UNIVERSAL EXPOSITION OF 1889.

OFFICE OF THE UNITED STATES COMMISSION, WASHINGTON BUILDING, No. 1 BROADWAY, NEW YORK, N. Y.

JANUARY 14, 1889.

GROUP 1.—FINE ARTS.

1. Proposed exhibits for this Group will be called for in New York, Brooklyn, and Jersey City at the expense of this Commission.

2. Notice of the number of articles and where located must be sent to W. S. Bud-

[Form 46.]

CIRCULAR No. 7.

UNITED STATES COMMISSION TO THE PARIS EXPOSITION OF 1889.

[WILLIAM B. FRANKLIN, Commissioner-General; SOMERVILLE P. TUCK, Assistant Commissioner-General.]

Washington Building, No. 1 Broadway, New York, N. Y.

[Paris Offices, 27 Avenue de la Bourdonnais. Cable addresses, New York, "Universal," Paris, "Uscom."]

JANUARY 19, 1889.

The attention of exhibitors is called to the fact that show-cases, counters, shelving and platforms, the unpacking and arranging of exhibits, the care thereof during the Exposition, the storage of packing-cases and repacking at the close, must be paid for by the exhibitors.

When an agent is to be employed to represent you, it is necessary to fill out and return inclosed blank to this Commission without delay.

SOMERVILLE P. TUCK,
Assistant Commissioner-General.

[Form 50.]

CIRCULAR No. 8.

UNITED STATES COMMISSION TO THE PARIS EXPOSITION OF 1889.

[WILLIAM B. FRANKLIN, Commissioner-General; SOMERVILLE P. TUCK, Assistant Commissioner-General.]

Washington Building, No. 1 Broadway, New York, N. Y.

JANUARY 24, 1889.

DEAR SIR: This Commission wishes to call your attention to the short time left to collect an educational exhibit, worthy of the United States, for the Paris Exposition of 1889. This exhibit can only be made what it ought to be by the prompt and hearty action of all who can lend their assistance. The present circular letter has, accordingly, been issued with the hope that all who receive it will contribute their mite in the interest of a representative collection. It will cost almost nothing to the individual, and, with the co-operation of others, will greatly add to the value of the Educational Group.

The matter desired is mentioned below, and it is hoped that all will contribute item No. 1, at least, and as many more of the items as possible.

1. A chart showing the hours devoted to each subject and each class during the course.

2. Photographic views and plans of buildings designed and erected since 1878. Also town map, showing location of school buildings, with primary school in one color, high school in another, etc.

3. Photographs of a group of ten students from each class, showing features and carriage.

4. Statistics of above groups, giving the age, weight, height, waist and breast measure of each student.

5. A few specimens of free-hand drawing, giving the number of hours of instruction and practice before the given drawing was undertaken, and the time required to complete the given specimen.

6. A few mechanical drawings with similar information to that called for in No. 5.

7. A few architectural drawings with similar information to that called for in No. 5.

8. Specimens of writing-books.

9. Specimens of other manual productions.

10. Latest circulars, catalogues and reports.

11. As many blank forms, etc., as convenient.

12. Volumes of writings by members of the faculty.

You will kindly arrange the above matter in bound volumes and portfolios, and forward* the same to Prof. C. Wellman Parks (Superintendent of Group II of this Exposition), 1825 Fifth Avenue, Troy, N. Y., at your earliest convenience, in order that he may arrange the matter for early shipment to Paris.

Yours respectfully,

WILLIAM B. FRANKLIN,
United States Commissioner-General.
SOMERVILLE P. TUCK,
United States Assistant Commissioner-General.

[Form 51.]

CIRCULAR No. 9.

UNITED STATES COMMISSION TO THE PARIS EXPOSITION OF 1889.

[WILLIAM B. FRANKLIN, Commissioner-General; SOMERVILLE P. TUCK, Assistant Commissioner-General.]

Washington Building, No. 1 Broadway, New York, N. Y.

JANUARY 25, 1889.

DEAR SIR: This Commission desires the United States Educational Exhibit at the

Please correct and arrange this matter in a portfolio, and forward* to Prof. C. Wellman Parks (Superintendent of Group II of this Exposition), 1825 Fifth Avenue, Troy, N. Y., at your earliest convenience, so that he may arrange it for early shipment to Paris.

Yours respectfully,

WILLIAM B. FRANKLIN,
United States Commissioner-General.
SOMERVILLE P. TUCK,
United States Assistant Commissioner-General.

[Form 39.]

Please fill out, sign and return this blank immediately in the FRANKED envelope inclosed herewith.

TO THE UNITED STATES COMMISSION, PARIS UNIVERSAL EXPOSITION OF 1889.

1 *Broadway, New York City, N. Y.*

EDUCATIONAL BLANK.

Name of institution:
Location:
Date of foundation:
Name of president:
Whole number of students (unclassified):
Number of male students:
Number of female students:
Number of post-graduate students:
Is it co-educational?
Has it a preparatory department?
Has it professional schools? If so, name them:
List of text books:
List of periodicals published by faculty and students:
What is the number of instructors in each school or college?
How many students in each school or college?
How many students in preparatory department?
What is the age of admission?
What is total amount of endowment?
What is the average cost of tuition?
What is the income?
If sectarian, state the denomination:
Blank filled out by
(Full name)
(Address)

---

* Send by mail, free of postage, by securely fastening to each package one of the penalty tags inclosed herewith.

[Form 57.]

PARIS UNIVERSAL EXPOSITION OF 1889.

COLLECTION TO ILLUSTRATE THE MINERAL RESOURCES OF THE UNITED STATES.

No. _____

Nature of ore _____

Name of mine _____

Locality _____

_____

Name of Collector or Donor _____

This label, when filled out, should be folded and placed next the ore, inside the wrapper.

[Form 56.]

CIRCULAR No. 10.

UNITED STATES COMMISSION TO THE PARIS EXPOSITION OF 1889.

[WILLIAM B. FRANKLIN, Commissioner-General; SOMERVILLE P. TUCK, Assistant Commissioner-General.]

Washington Building, No. 1 Broadway, New York, N. Y.

[Paris offices, 27 Avenue de la Bourdonnais. Cable addresses: New York, "Universal," Paris, "Uscom."]

JANUARY 29, 1889.

[Form 58.]

CIRCULAR No. 11.

PARIS UNIVERSAL EXPOSITION OF 1889.

OFFICE OF THE UNITED STATES COMMISSION, WASHINGTON BUILDING,
No. 1 BROADWAY, NEW YORK, N. Y.

SHIPPING INSTRUCTIONS.

Special attention in called to the following shipping instructions. Compliance therewith in every detail is necessary to insure the proper delivery of exhibits at the grounds of the Paris Universal Exposition of 1889.

SHIPPING MARK AND LABELS.

1. **Mark on each case or package in 6-inch letters within a circle** (E.U.)

2. **Paste one of the inclosed labels on each end, and one on top of each case or package, making three in all. As an additional precaution tack each corner.**

3. **Enter in space provided on each label the exhibitor's name and address, the total number of cases making up consignment, and the consecutive number in each case.**

4. ***The weight in pounds and the number of cubic feet, outside measurement, of each case must be specified in blank space provided on each label.***

INVOICES.

5. **The exhibitor must make five copies of the invoice, for which purpose blank invoices are inclosed.**

6. **Send three by mail, when shipping goods, with bill of lading, inclosed in the accompanying envelope. Securely fasten one on the inside of the lid of the box, in the package, or to the article to which it refers. Should there be more than one box or package, the invoice must accompany No. 1. Retain one.**

7. **Your consignment must be sent by fast freight, when possible, and charges paid to New York.**

8. **The forwarding of your exhibit to New York is requested at the earliest date. If impracticable to forward as a whole, ship such portion of it weekly as possible, commencing January 28. It will facilitate shipment from New York if you can arrange to have your goods arrive on Wednesday or Thursday of each week.**

9. **Consign your goods on bill of lading to General William B. Franklin, New York, and forward bill of lading and invoices by mail direct to the Commission, No. 1 Broadway, New York City.**

10. **Upon arrival of your exhibit at New York, this Commission will cause the same to be transferred from rail or boat terminus to steamer at your expense, and will send you bill for cartage, accompanied by the Commission's receipt.**

WILLIAM B. FRANKLIN,
Commissioner-General.
SOMERVILLE P. TUCK,
Assistant Commissioner-General.

CIRCULAR.

REIMPORTATION OF ARTICLES SENT TO THE PARIS EXHIBITION OF 1889.

[1889. Department No. 31, Division of Customs]

TREASURY DEPARTMENT, OFFICE OF THE SECRETARY,
Washington, D. C., March 22, 1889.

To OFFICERS OF THE CUSTOMS AND OTHERS:

Manufactures, articles, or wares produced or manufactured in the United States, which may be sent to the Paris Exhibition of 1889 for exhibition, will, upon their return to the United States, be admitted to free entry, upon compliance with the following requirements—that is to say, shippers, at the time and port of exportation, shall file at the custom-house a manifest showing the marks and numbers of the packages, together with an invoice or statement specifying the contents of such packages (which documents may, if the shippers so desire, be filed by Mr. Somerville P. Tuck, Assistant Commissioner-General of such Exhibition, whose office is at No. 1 Broadway, New York, and who will act as their agent for such purpose), and shall, upon return of the packages, produce certificates either from the Director or other proper officers of the said Paris Exhibition, duly authenticated by a United States minister or consular officer, or by a statement of the consignees at the foreign port from which the reimportations may be made, certified by a proper officer of the customs at that port, as required by Department's circular of March 31, 1886, which documents shall fully identify the goods.

Paintings and other works of art, the production of foreign schools of art, which may be now owned in this country by residents of the United States, and which may be loaned to the French Department of Fine Arts of said Paris Exhibition of 1889 for exhibition, will also, upon their return to the United States, be exempted from the payment of duty upon their identity being established in the manner hereinbefore prescribed, that is, by the records of the custom-house at the port of exportation and the production of statements or certificates from the director or other officer in charge of the Fine Arts Department of said Exhibition, duly au-

You are respectfully requested to send to this Commission *at once, in duplicate,* such catalogues and general literature as have been issued by your company.

Send by mail, free of postage, by pasting to your package the inclosed label containing the printed address of the Commissioner-General.

Yours respectfully,

WILLIAM B. FRANKLIN,
United States Commissioner-General.
SOMERVILLE P. TUCK,
United States Assistant Commissioner-General.

N. B.—This Commission is collecting for the Electrical Department of the Exposition an album of photographs and drawings representing electric plants, installations, factories, machines, and instruments constructed in the United States. The Commission would be glad to have you likewise contribute to the completion of this exhibit.

[Form 66.]

CIRCULAR No. 14.

UNITED STATES COMMISSION TO THE PARIS EXPOSITION OF 1889.

Washington Building, No. 1 Broadway, New York, N. Y.

MARCH 1, 1889.

It will prevent delay in the issue of admission tickets to the Exposition if exhibitors will send by mail, prepaid, two copies of their photographs (carte de visite size, 4 by 2 inches), to the United States Commission, 27 Avenue de la Bourdonnais, Paris, France. The full name and address of the person to whom the ticket is to be issued should be inclosed therewith, together with the exhibitor's number. An application for extra tickets, when such are desired, should also be inclosed, according to paragraph 2 of the following extract from the French Official Regulations.

For the information of exhibitors the following translation has been made from the official regulations relating to admissions:

1. A single gratuitous admission ticket will be issued to each exhibitor, or to his agent duly authorized, which will be delivered only to the exhibitor or his agent, and to the latter on the written request of the exhibitor.

2. If, in consequence of the size or importance of the exhibit, the services of one or more attendants are required, the exhibitor must apply for tickets for the number desired, which application will be passed upon by the French Administration and a special certificate issued for the admission of such employés as are considered necessary.

3. The price of admission to the Exposition is as follows: *Day Admission.* ONE FRANC per person during the hours of general admission; TWO FRANCS per person during the hours devoted to students. *Evening Admission.* TWO FRANCS per person during the week; ONE FRANC per person on Sunday. The price of tickets for evening entertainments will be regulated hereafter.

4. *Subscription Tickets.*—ONE HUNDRED FRANCS per person for the entire period of the Exposition. These will bear the name of the person to whom they are issued, must be signed by him, and he must reproduce his signature on a special register at the request of the ticket collectors. Any ticket that is transferred will

be confiscated, and the person so transferring his ticket and the person making use of a ticket not belonging to him will be prosecuted according to law.

5. There will be no free admission except by the non-transferable personal tickets issued to exhibitors, their agents and employé, and officials; and referred to in section 1 above.

WILLIAM B. FRANKLIN,
United States Commissioner-General.
SOMERVILLE P. TUCK,
United States Assistant Commissioner-General.

[Special circular to the press.]

OFFICE OF THE UNITED STATES COMMISSION
TO THE PARIS EXPOSITION OF 1889.
No. 1 Broadway, New York City, N. Y., December 7, 1888.

To the EDITOR:

DEAR SIR: I send you herewith a synopsis of the Social Economy Exhibit to be held in connection with the Paris Universal Exposition of 1889, thinking that the particulars concerning American contributions may interest the readers of your valuable paper.

If you are of this opinion, the Commission will be glad to have you publish the article, in whole or in part.

Yours respectfully,

SOMERVILLE P. TUCK,
Assistant Commissioner-General.

Mr. Georges Berger, the Director-General of the Paris Universal Exposition of 1889, has issued a *brochure* of 150 pages, on the "Exposition d'Economie Sociale," which is to be held in connection with the main Exposition. The Exposition of Social Economy is divided into fifteen sections, the second of which is devoted to profit-sharing and productive co-operation. Mr. Charles Robert, No. 15 Rue de la Banque, Paris, is president of this section, and several noted profit-sharing employ-

lectures and discussions on all the subject-matters of the fifteen sections will be held, and reports made from various countries. M. Berger states that the principal object of the exhibit is to make uninformed employers and workmen familiar with the methods of those who have proved successful in the same line of work, and to present to the world an impartial survey of social economy at the close of the nineteenth century, with its gradual development, actual condition, and probable outcome.

PARIS UNIVERSAL EXPOSITION OF 1889.

OFFICE OF THE UNITED STATES COMMISSION,
27, *Avenue de la Bourdonnais, Paris (France), April* 10, 1889.

SIR: This is to inform you that as an exhibitor you are entitled to free admission to the grounds and buildings of the Universal Exposition.

In order to avail yourself of this privilege, you must send, immediately, to the above address, two photographs, carte de visite size 0^m, 107 by 0^m, 065, with your full name, nationality, and present address plainly written upon the back of each.

Messrs. Van Bosch & Co., 10, Boulevard Montmartre, have notified the United States Commission that they will take the photographs required free of charge.

WILLIAM B. FRANKLIN,
Commissioner-General.

[Form 62.]

CIRCULAR No. 12.

PARIS UNIVERSAL EXPOSITION OF 1889.

OFFICE OF THE UNITED STATES COMMISSION,

WASHINGTON BUILDING, NO. 1 BROADWAY, NEW YORK, N. Y.

[WILLIAM B. FRANKLIN, Commissioner-General; SOMERVILLE P. TUCK, Assistant Commissioner-General.]

FEBRUARY 1, 1889.

INFORMATION FOR THE JURY.

To Exhibitors:

Exhibitors are requested to fill out the accompanying blank and forward it at once in the inclosed franked envelope to General William B. Franklin, United States Commissioner-General, Washington Building, No. 1 Broadway, New York, N. Y.

If the spaces opposite each question are not adequate, the answers can be written on the opposite page, or on separate sheets of paper, attached and numbered to correspond.

Catalogues, price-lists, and all other information published by exhibitors should also be forwarded as above.

Immediate attention must be given to this request.

WILLIAM B. FRANKLIN,
United States Commissioner-General.
SOMERVILLE P. TUCK,
United States Assistant Commissioner-General.

INFORMATION FOR JURY TO ACCOMPANY EACH EXHIBIT.

Exhibitors must immediately answer the following questions, so far as possible, and forward this blank, properly filled out, in the inclosed franked envelope, to General William B. Franklin, United States Commissioner-General, Washington Building, No. 1 Broadway, New York, N. Y.

Questions.	Answer.
1. Nature of the exhibit.	
2. Number of application.	
3. Where produced or manufactured.	
4. Extent and capacity of works.	
5. Kind and quantity of power used.	
6. Number of persons employed. { Men. Women. Children.	
7. Extent and value of the annual production.	
8. Business—when commenced.	
9. Markets and place of consumption.	
10. Sources of materials used.	
11. Peculiarities of the object shown, or of the manufacture. State all considerations relating to invention, discovery, utility, quality, skill, workmanship, fitness for purpose intended, adaptation to public wants, economy and cost.	
12. Special or particular claim of merit to which the exhibitor desires to call the attention of the jury.	
13. What prizes have been awarded to the exhibitors at previous International Exhibitions?	
14. State what special provision has been made, if any, for the promotion of health, morals, and education of the workmen.	
15. Give signature in full of the applicant for	

[redacted]

PARIS UNIVERSAL EXPOSITION OF 1889.

UNITED STATES COMMISSION, 1 BROADWAY, NEW YORK, N.Y.

Application for space No. ———. *Group No.* ———. *Class No* ———.

The undersigned (1) ——— ———, doing business at (2) ———, make application to exhibit the articles specified below: (3) ———, for the installation of which, space will be needed of the following dimensions: (4) —— length, —— height, —— width —— area.

Floor space:

Wall space:

[Signature] ——— ———.

(1) State individual, firm or company name in full.

(2) State address of office and works in full.

(3) Give complete description of articles in detail. State if it is desired to exhibit machines or other objects requiring foundations or special constructions, and furnish a sketch of these foundations or constructions, with side elevations. In case it is desired to exhibit apparatus requiring the use of water, gas, or steam, state the necessary quantity and pressure of each. If it is desired to show machines in operation, state the speed of each of them, and the power required, expressed in horse-power.

(4) These dimensions should include those of the show-cases, counters, or platforms necessary for the installation of the articles. Scale drawings of show-cases must be furnished.

[Indorsement.]

Applicants will please not fill out the indorsement below.

PARIS UNIVERSAL EXPOSITION OF 1889.

UNITED STATES COMMISSION.

Application for space, No. ———.

Group No. ———. Class No. ———.

Name ———.

Address ———.

Nature of Exhibit ———.

Floor space required ———.

Wall space required ———.

Floor space allowed ———.

Wall space allowed ———.

Steam ———.

Gas

Water

Received ———.

Notified ———.

PARIS UNIVERSAL EXPOSITION OF 1889.

UNITED STATES COMMISSION, 1 BROADWAY, NEW YORK, N. Y.

Application for Space No.———. *Group No.* 1. *Class No.*———.

The undersigned, a citizen of the United States (Full name)——— ———.

Address ———.
Place of birth ———.
Makes application to exhibit the articles specified below (1) ———.
Titles and descriptions ———.

Owner and price ———.
Where to be returned ———.
Names of masters ——.
Recompenses ———.
For the installation of which, space will be needed of the following dimensions (2):—— length,—— height,—— width,—— Area.
Floor space ———.
Wall space ———.
Date ———.

[Signature]——— ———

1 Give complete description of articles in detail, as it will form the basis of the catalogue entry. If

UNITED STATES COMMISSION TO THE PARIS UNIVERSAL EXPOSITION OF 1889.

[WILLIAM B. FRANKLIN, Commissioner-General.—SOMERVILLE P. TUCK, Assistant Commissioner-General.]

Washington Building, No. 1 Broadway, New York, N. Y.

PERMIT FOR SPACE.

NEW YORK CITY,—— ——188—

M——— ——

Referring to your application for space to exhibit at the Exposition above named, you have been allotted space as follows: In Group —— Class ——

Inclosed is a blank acceptance, which you are requested to fill in, sign and return at once. You will hereafter receive instructions as to labels, invoice and shipping.

——— ———

Commissioner-General.

[Please fill up, sign, and return this blank immediately.]

To the UNITED STATES COMMISSION, PARIS UNIVERSAL EXPOSITION OF 1889.

1 *Broadway, New York, N. Y.*:

SIRS: The undersigned hereby accept — the space allotted to ——— ———, at the Exposition above named, and agree to occupy the space creditably, and in accordance with the rules of the Commission. Labels are required for ——— cases, which will measure ——— cubic feet, and weigh ——— pounds,* and it is agreed that the exhibit shall be ready for shipment from —— place of business not later than January 15, 1889.

Dated ———.

Name, ————.

Address, ————.

*This is most important. Give approximate weight and measurement if you cannot state them exactly.

[Indorsement.]

Exhibitors will please not fill out the Indorsement below.

UNITED STATES COMMISSION

TO THE

PARIS UNIVERSAL EXPOSITION OF 1889.

Name ———.

Address ———.

Agreement to Exhibit No. ———.

Group No. ———.

Class No. ———.

Received ———.

[redacted]

[Form 59.]

UNITED STATES COMMISSION TO THE PARIS UNIVERSAL EXPOSITION OF 1889.

[WILLIAM B. FRANKLIN, Commissioner-General; SOMERVILLE P. TUCK, Assistant Commissioner-General.]

Washington Building, No. 1 Broadway, New York, N. Y.

RECEIPT.

NEW YORK, N. Y., ——— ——, 1889.

Received of ——— ——— packages containing articles for exhibition at the Paris Universal Exposition of 1889, at Paris.

From ——— ——— exhibitor, ———, on which the following charges are due by the exhibitor above named.

Transportation.....

Terminal.....

Total.....

Exhibit No. ———.

Condition ———.

For the Commissioner-General,

———— ————,

————— ————.

[Indorsement.]

PARIS UNIVERSAL EXPOSITION OF 1889.

RECEIPT FROM UNITED STATES COMMISSION.

Rate ———.

Received of ———.

No. of packages, ———.

Exhibitor ———.

Address ———.

Exhibit No. ———.

Charges paid ———.

Transportation ———.

Terminal ———.

Total ———.

[Form 47.]

If an agent is to be employed, please fill up, sign, and return this blank immediately.

EXHIBIT No. ———.

General WILLIAM B. FRANKLIN,
United States Commissioner-General, Paris Universal Exposition of 1889,

No. 1 *Broadway, New York, N.Y.*

SIR: You are hereby notified that ——— ——— is authorized to take charge of ——— exhibit No. ———, to attend to all matters in connection therewith, and represent ——— ——— as fully as if ——— ——— personally present ———.

Name, ——— ———.
Address, ———.
Date, ———.

[Form 48.]

Record of shipments Exposition goods to Paris, 1889.

Exhibit No.	Group No.	Class No.	Exhibitor.	Address.	Estimate.			Ready for shipment.	Mark.	No. of cases.	Steamer.	Date.	Value.	Disbursements.		Remarks.
					No. of cases.	Cubic measurement.	Weight.							Cartage.	Storage.	

[redacted]

[Form 49.]

PARIS UNIVERSAL EXPOSITION OF 1889.

UNITED STATES COMMISSION.

Invoice.

Exhibit No. ——.
Name, ——.
Address, ——.

How shipped, ——.
Date, ——.
Number of cases, ——.

No. of each case.	Exact dimensions of each case.	Weight in pounds.	Description of contents of each case.	Estimated value.

Shipped to ——.

WILLIAM B. FRANKLIN,
Commissioner-General.

Signature of exhibitor. —— ——.

[Indorsement.]

PARIS UNIVERSAL EXPOSITION OF 1889.

UNITED STATES COMMISSION.

INVOICE.

Exhibit No. ——.
Name, ——.
Address, ——.
No. of cases, ——.
Shipped by ——.
From ——.
On ——, 1889.
To WILLIAM B. FRANKLIN,
Commissioner-General.
Goods received ——, 1889.

INSTRUCTIONS.

1. All cases must be labeled with the accompanying labels and in accordance with the instructions thereon.
2. Should there be more than one article in a case, give description of each in the fourth column, and value opposite in the fifth column.
3. Covers of cases must be fastened on with screws.
4. Ship by fast freight when possible, and charges paid to address hereafter to be furnished by the Commission.
5. The commissioners will take every precaution to secure the careful handling and transportation of articles, but it must be distinctly understood that they will not insure, nor will the United States Commission be in any way responsible for damage or loss.
6. The exhibitors must make five copies of this invoice and dispose of them as follows: Send three by mail at the time of shipping goods, pinned to the bill of lading, to the United States Commission, No. 1 Broadway, New York City. Securely fasten one on the inside of the lid of the case or to the article to which it refers. Retain one. (N. B.—Should there be more than one case, the invoice must accompany No. 1.)

United States flag, printed in colors.

Group—— Class——

From

—— ——

—— ——

—— ——

Exhibit No.——

Total No. of Cases—— Weight——

Number of this Case——

Measurement, cubic feet——

UNIVERSAL EXPOSITION OF 1889 AT PARIS.

UNITED STATES COMMISSION.

——

To

Gen'l WILLIAM B. FRANKLIN,

Commissioner-General.

Champ de Mars,

Paris,

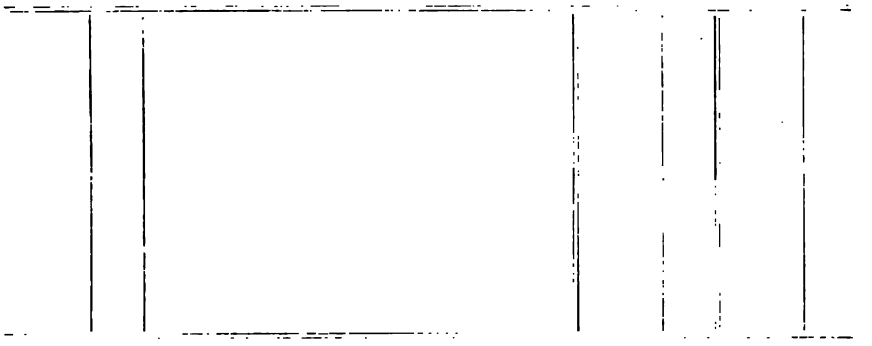
France.

——

Paint on each case (E.U.) in 6 inch letters.

[redacted]

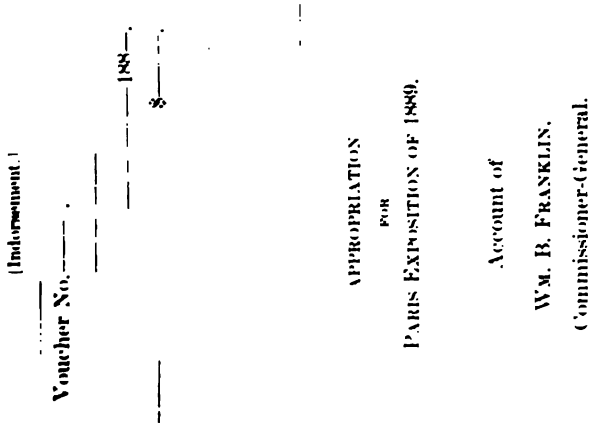
The United States, to —— —— *Dr. on account of appropriation for the Paris Exposition of* 1889. (*Public Resolution, No.* 11, *approved May* 10, 1888.)



Received at ——, this —— day of ——, 188—, from William B. Franklin, Commissioner-General, the sum of —— dollars, in full payment of the above account.

$——.

To be signed in duplicate by principals only.



Abstract of expenditures by William B. Franklin, Commissioner-General, on account of the appropriation for Paris Exposition of 1889, *for the month of* ——, 188—.

No. of voucher.	To whom paid.	Object of expenditure.	Amount.	
			$	Cts.

I certify that the above abstract is correct.

——— ———,
Commissioner-General.

[Indorsement.]

CT OF EXPENDITURES
h of ——, 188—.

PPROPRIATION.
FOR
EXPOSITION OF 1889.

Account of
M. B. FRANKLIN,
missioner-General.

[redacted]

The United States in account-current with William B. Franklin, Commissioner-General, for the month of ———, 188—.

APPROPRIATION FOR PARIS EXPOSITION OF 1889.

Dr.	$	Cts.	Cr.	$	Cts.
To amount received from the United States			By amount of abstract		
Diplomatic warrant No. —, Draft No. —, Ass't Treas'r, New York					
Balance due the United States ———, 188—					

———— ————,
Commissioner-General.

[Indorsement.]

ACCOUNT CURRENT

For the month of ———, 188—.

APPROPRIATION

FOR

PARIS EXPOSITION OF 1889.

Account of

WM. B. FRANKLIN,

Commissioner-General.

The United States in account-current with William B. Franklin, Commissioner-General, for the month of ——, 188—.

APPROPRIATION FOR PARIS EXPOSITION OF 1889.

[Joint resolution approved May 10, 1888.]

DR. CR.

Date.	Expenditures.	Amount.	Date.	Receipts.	Amount.
	To amount of disbursements for the month of ——, 188-, as per abstract,			By balance cash due the United States, brought forward from —— account-current 188-.	
				By amount of draft No. —— (diplomatic warrant No. ——) of the Treasurer of the United States to Assistant Treasurer at New York, Y. N.	
	To balance due the United States,				

I certify that this account-current is correct.

——, ——,
Commissioner-General.

[redacted]

(*B*) DURING THE EXHIBITION.

[Circular.]

OFFICE OF THE UNITED STATES COMMISSIONER-GENERAL,
Paris, June 25, 1889.

The following is a translation of a communication received from the French administration:

"The Director-General reminds the engineers and architects of the French classes and of the foreign sections that the general regulations absolutely forbid the sale of manufactured articles in the halls of the Exposition. He requests them, therefore, to see that this order is rigorously observed, and to communicate this circular to their exhibitors.

"Those exhibitors who do not conform to the above will be prosecuted."

Exhibitors are respectfully requested to comply with the above-mentioned regulations, and are informed that in case this is not done by them, the Commission will take steps to prevent the sale of articles in the United States section.

By order of the Commissioner-General.

WM. C. GUNNELL,
Engineer United States Commission.

[Ministère du Commerce, de l'Industrie et des Colonies. Exposition Universelle de 1889. Direction Générale de l'Exploitation.]

[Translation.]

RÉPUBLIQUE FRANÇAISE.

PARIS, 16 *Avenue de la Bourdonnais*, 18 *July*, 1889.

SIR: I have the honor to call your attention to the provisions of Article 38 of the General Regulations, which states that objects sold cannot be removed before the end of the Exposition without a special authorization.

The enforcement of this article is more than ever necessary for the reason that it is the common interest of all to resist the tendency on the part of many exhibitors to empty their show-cases as soon as the operations of the jury are finished.

Strict orders have been given to those in charge of all exits to prohibit the carrying out of any article which is not accompanied by a permit signed by me and countersigned by the proper officers of the Douane and Octroi.

Special permits should be requested, by those interested, at my offices.

Receive, sir, the assurance of my distinguished consideration.

G. BERGER,
Director-General.

Commissioner-General Franklin.

[Ministère du Commerce, de l'Industrie et des Colonies. Exposition Universelle de 1889. Cabinet du Directeur Général de l'Exploitation.]

[Translation.]

RÉPUBLIQUE FRANÇAISE.

PARIS, 16 *Avenue de la Bourdonnais*, 23 *July*, 1889.

SIR: I have the honor to call your attention to certain abuses which, if they do not cease immediately, will cause the greatest embarrassment. The general regulation formally prohibits the sale of manufactured articles of exhibitors. I have consented, however, not to enforce this regulation rigorously, but it is indispensable

that the objects sold shall be only those made in sight of visitors and by exhibited machines. This measure, which I think you will approve, can only be carried out if you will order the guardians of your section to keep a strict watch in this matter, which in any event it is their duty to do.

Every day the number of sellers increases, and in each class articles are sold quite different from those which are made there. This comes from the fact that certain exhibitors give up a part of their space to persons who are only sellers, and the Expositions will soon be encumbered by them.

I request that you will charge the engineer of your section to see that these abuses cease immediately, and that no place shall be occupied by any person who is not an exhibitor regularly admitted.

Accept, sir, the assurance of my high consideration.

G. BERGER,
Director-General.

General Franklin,
Commissioner-General of the United States.

(*C.*) INCIDENT TO THE CLOSE.

[United States Commission, Paris Exposition of 1889, 27 Avenue de la Bourdonnais.]

PARIS, FRANCE, *September* 15, 1889.

NOTICE TO EXHIBITORS IN THE UNITED STATES SECTIONS.

The exposition will close on the 31st of October next.

I request to be informed at once what disposition you wish to have made of your exhibit.

You will oblige me, therefore, if you will as soon as possible inform me whether you will have the goods returned to the place from which they came, it being understood that the United States will deliver them in New York free of all charges for freight from here to the steamer wharf in New York. Any other charges which

UNITED STATES COMMISSION, PARIS EXPOSITION OF 1889,
27 AVENUE DE LA BOURDONNAIS,
Paris, October 31, 1889.

NOTICE TO EXHIBITORS IN THE UNITED STATES SECTIONS.

All goods which were exported from the United States and have formed part of its exhibit will, if not otherwise disposed of, be taken at the Exposition, when the prescribed regulations are complied with, and transported to New York free of expense to the exhibitors.

Exhibitors and their agents are cautioned against any infraction of customs regulations. No uncommon privileges will be allowed, and the customary examination will in all probability be carried out in New York and the legal penalties imposed.

To prevent confusion, loss, delay, and customs difficulties the following regulations should be strictly complied with, without which no packages will be accepted for shipment:

1. Only goods exported from the United States and having formed part of its exhibit will be received.

2. The contents of each box must be invoiced on blanks. The exhibitor must make five copies of the invoice on forms issued by the Commission. One of these invoices is to be put into the box, one is to be retained by the exhibitor, and the other three handed to the superintendent of the section for the use of the Commission and shippers. These invoices will be sworn to by the exhibitor or his agent before some person deputed by the United States Commissioner-General for the purpose, and will be used in connection with the invoices furnished at the time of exportation to identify the goods by the custom-house authorities in New York. Any article not invoiced found in the cases will subject the exhibitor to fines and confiscation, in accordance with the laws of the United States.

3. When the cases are ready for shipment they will be legibly marked with the owner's name and address, the original application number, the total number of cases making up the shipment, and the consecutive number of each case, upon labels furnished by the Commission. The weight in pounds and the number of cubic feet, outside measurement of each case, must also be specified in the blank space provided on each label. Three labels will be supplied for each case. Paste one of the labels on each end and one on top of each case or package; and as an additional precaution tack each corner of the label.

By authority of the United States Commissioner-General.

W. C. GUNNELL,
Engineer United States Commission.

——— ——— U. S.,
——— ——— 1889.

To the UNITED STATES COMMISSIONER-GENERAL OF THE PARIS EXPOSITION OF 1889,
27 *Avenue de la Bourdonnais, Paris, France*:

SIR: You will oblige —— by delivering —— exhibit, now in Paris International Exposition, to ——— ———,of ——— ———,who —— hereby authorized to receive it and take charge of it in ——— name.

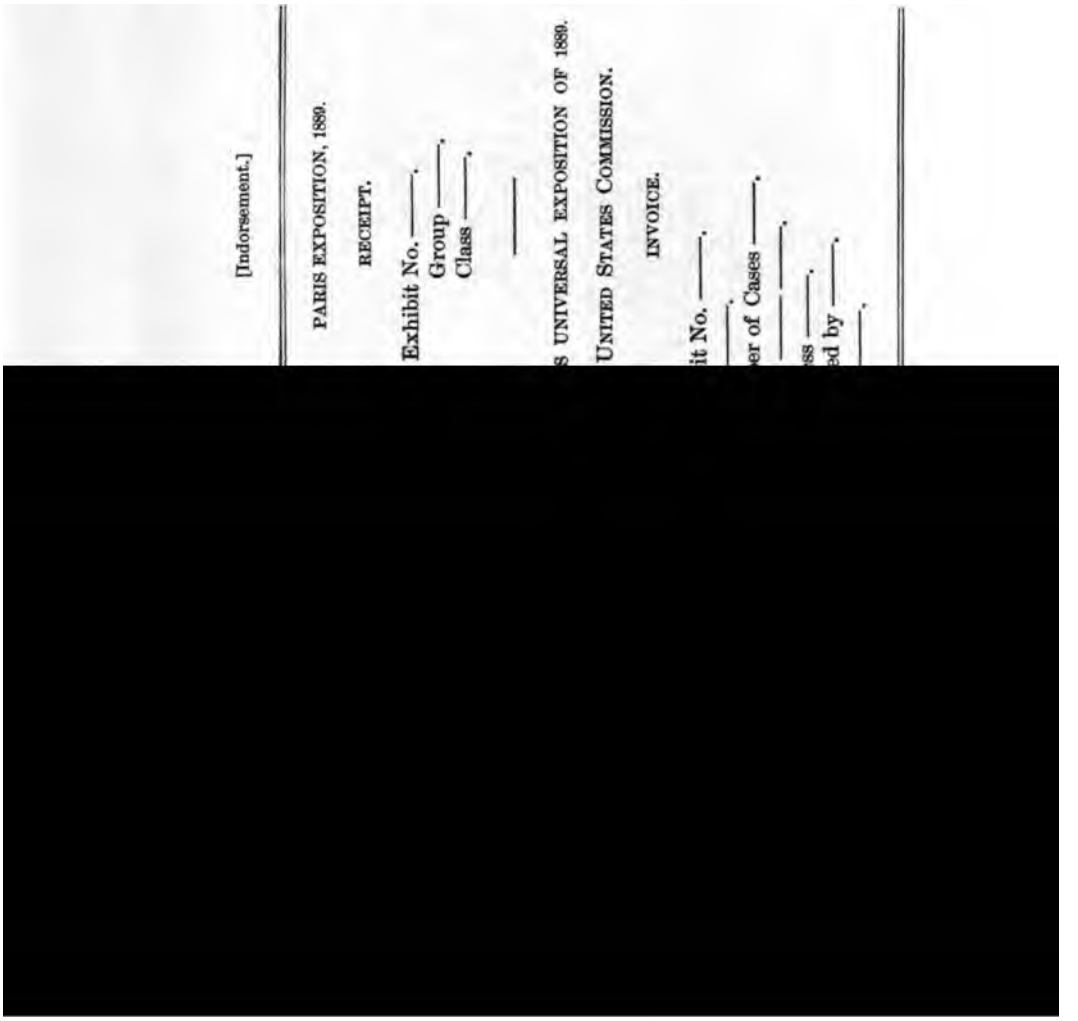
———— ————,
———— ————.

UNITED STATES COMMISSION, PARIS EXPOSITION, 1889.

———— ————, 18—.

Received from General William B. Franklin Commissioner-General ——— ——— being ——— Exhibit of ——— No. ———, Group ———, Class ———, and transferred to ——— under authority of letter of ——— dated ———.

Signature ——— ———,
Address ——— ———.



No. of each case.	Exact dimensions of each case.	Weight in pounds.	Description of contents of each case.	Estimated value.

Shipped to ——— ———.
By General WM. B. FRANKLIN,
United States Commissioner-General.

[Indorsement.]

PARIS EXPOSITION, 1889.

UNITED STATES COMMISSION.

INVOICE.

Exhibit No. ———.
Class ———.
Number of Cases ———.
Exhibitor ———.
Address ———.

Shipped by
General WM. B. FRANKLIN,
United States Commissioner-General.

To ———.

INSTRUCTIONS.

1. **All cases must be labeled with the accompanying labels, and in accordance with the instructions thereon.**

2. **Should there be more than one article in a case, describe each one in the fourth column, and state its value in the fifth column.**

3. **All crates, boxes, etc., should be securely nailed or screwed; the Commission will take every precaution to insure the careful handling and transportation of goods, but they do not insure, nor will they in any way be responsible for damage or loss.**

4. **Exhibitors will make five copies of this Invoice — Retain one (1); fasten one in case No. 1 — and deliver three (3) to the United States Commission, at ———, 27 Avenue de la Bourdonnais, Paris.**

UNIVERSAL EXPOSITION, PARIS, 1889.

DECLARATION OF INVOICE.

I, the undersigned, declare that I am ——— ——— of ———, exhibitor, the shipper of wares, goods, and merchandise belonging to the said exhibitor, which were exported from the United States and exhibited in the United States section at the Universal Exposition at Paris, 1889.

I also declare that the invoice annexed is a true, full, and faithful description of the goods, wares, and merchandises contained in the cases noted on the said invoice, and that the said cases contain nothing but articles shipped from the United States and exhibited in the United States section.

Signature:

OFFICE OF THE UNITED STATES COMMISSION, PARIS EXPOSITION, 1889.

Paris, ——— ——— 188—.

I hereby certify that the annexed invoice, numbered —— in which are mentioned and described certain goods, wares, and merchandises, was produced to me by the subscriber of the foregoing, who thereupon declared that all the goods, wares, and merchandises therein mentioned and described have formed a part of the United States Exhibit at the Universal Exposition at Paris, 1889, and were exported from the United States for that purpose, and that it was intended to re-enter the said goods, wares, and merchandises into the United States.

I do further certify that the person making the above declaration is the person he represents himself to be, and that so far as I have the means of knowing, the statements made in the said declaration are true.

Witness my hand and seal of the United States Commission, this —— day of ———, 1889.

W. B. FRANKLIN,
Commissioner-General.

By ——— ———.

CONSULATE-GENERAL OF THE UNITED STATES OF AMERICA FOR FRANCE, PARIS.

Be it known that on the —— day of ——— one thousand eight hundred and ———, before me the undersigned ——— ———, consul general of the United States of America, at Paris, in France, personally appeared ——— ———, personally known to me, and known to me to be the duly authorized deputy of the United States Commissioner-General of the Paris Exposition of 1889, and known to me to be the person who executed the certificates attached to the invoices enumerated and described in the annexed abstract of invoices of goods shipped from the Paris Exposition to New York, and dated the —— day of ——— 18—, and duly acknowledged to me that he executed the same freely and voluntarily for the uses and purposes therein mentioned.

In testimony whereof I have hereunto set my hand and seal of office the day and year above written.

———— ————.

Consul-General of the United States of America at Paris, France.

———

Abstract of invoices of goods shipped from the Paris Exposition to New York per ——— ———, on the —— day of ———, 18—.

Exhibit No.	Numbers of cases.	Cubic measurement.	Total Weight.	Total number of cases.	Exhibit No.	Numbers of cases.	Cubic measurement.	Total Weight.	Total number of cases.

W. B. FRANKLIN,
United States Commissioner-General.
Per ——— ——— *Deputy.*

[Indorsement.]

ABSTRACT OF INVOICES.

Declared ——— ———.

PARIS EXPOSITION GOODS.

A label, one-third blue, two-third red and white stripes, with the following printed across the face:

With care. Keep dry. Exhibitors will attach with liquid glue 3 labels to each package.

Shipped by General Wm. B. FRANKLIN, *United States Commissioner-General to Paris Exposition, 1889.*

To ——— ———

——— ———

——— ———

Exhibit No —— Class ———. Total No. of Cases ———.

Number of this case ———. Weight ——— pounds. Cubic feet ———.

APPENDIX J.

SYNOPSIS OF CLASSIFICATION.

UNIVERSAL EXPOSITION OF 1889 AT PARIS.

GROUP I.—WORKS OF ART.

CLASS 1. Oil paintings.
2. Paintings of different kinds and drawings.
3. Sculpture and engravings on medals.
4. Architectural drawings and models.
5. Engravings and lithographs.

GROUP II.—EDUCATION AND INSTRUCTION.—APPARATUS AND PROCESSES USED IN THE LIBERAL ARTS.

CLASS 6. Education of young children. Primary instruction. Instruction of adults.
7. Organization and appliances for secondary instruction.
8. Organization, methods, and appliances for higher instruction.
9. Printing and books.
10. Stationery, bookbinding, and articles used in painting and drawing.
11. Ordinary application of the arts of drawing and modeling.
12. Photographic proofs and apparatus.
13. Musical instruments.

GROUP IV.—TEXTILE FABRICS.—WEARING APPAREL AND ACCESSORIES.

CLASS 30. Cotton thread and fabrics.
31. Thread and fabrics of hemp, flax, etc.
32. Threads and fabrics of combed wool. Threads and fabrics of carded wool.
33. Silks and silk fabrics.
34. Laces, net, embroidery, and trimmings.
35. Articles of hosiery and underclothing. Accessories of wearing apparel.
36. Wearing apparel of both sexes.
37. Jewelry and precious stones.
38. Portable weapons, hunting.
39. Articles of traveling and camp equipage.
40. Toys.

GROUP V.—EXTRACTIVE ARTS.—RAW AND MANUFACTURED PRODUCTS.

CLASS 41. Products of mining and metallurgy.
42. Products of forest growth and forest industries.
43. Products of hunting. Products of fisheries. Apparatus and instruments for fishing and for gathering fruits of natural growth.
44. Agricultural products not used for food.
45. Chemical and pharmaceutical products.
46. Chemical methods of bleaching, dyeing, printing, and finishing.
47. Leather and skins.

GROUP VI.—APPARATUS AND PROCESSES OF MECHANICAL INDUSTRIES.—ELECTRICITY.

CLASS 48.—Apparatus and methods of working mines and of metallurgy.
49. Apparatus and methods of farming and forestry.
50. Apparatus and methods used in agricultural work and food industries.
51. Apparatus used in chemistry, pharmacy, and tanning.
52. Machines and apparatus of general mechanics.
53. Machine tools.
54. Appliances and methods of spinning and rope-making.
55. Apparatus and methods of weaving.
56. Appliances and methods of sewing and making articles of clothing.
57. Appliances and methods of manufacture of articles for furniture and dwellings.
58. Appliances and methods of paper manufacture, coloring, and printing.
59. Machines, instruments, and methods used in various occupations.
60. Carriage-making, wheelwrights' work, harness-making, and saddlery.
61. Railroad appliances.
62. Electricity.
63. Appliances and methods of civil engineering, of public works, and architecture.
64. Hygiene and public charities.
65. Navigation and life-saving.
66. Apparatus and methods of the art of war.

GROUP VII.—FOOD PRODUCTS.

CLASS 67. Cereals. Farinaceous products with their derivatives.
68. Products of the bakery and pastry shop.
69. Fat substances used for food, milk products, and eggs.

GROUP VII.—FOOD PRODUCTS—Continued.

CLASS 70. Meats and fishes.
71. Vegetables and fruits.
72. Condiments and stimulants; sugar, and products of confectionery.
73. Fermented drinks.

GROUP VIII.—AGRICULTURE, CULTIVATION OF THE VINE, AND FISH CULTURE.

CLASS 73 *Bis.* Agronomy. Agricultural statistics.
73 *Ter.* Organization, methods, and appliances of agricultural instruction.
74. Specimens of farm improvements and agricultural works.
75. Vine cultivation.
76. Useful and injurious insects.
77. Fish, crustacea and mollusks.

GROUP IX.—HORTICULTURE.

CLASS 78. Conservatories and horticultural apparatus.
79. Flowers and ornamental plants.
80. Vegetables.
81. Fruits and fruit trees.
82. Seeds and saplings of forest species.
83. Hothouse plants.

SOCIAL ECONOMY.

SECTION I. Remuneration of Labor.
II. Profit-sharing.
III. Trade Syndicates.
IV. Apprenticeship.
V. Mutual Aid Societies.
VI. Superannuation Funds and Annuities.

APPENDIX K.

CLASSIFIED CATALOGUE OF UNITED STATES EXHIBITORS.

GROUP 1.—WORKS OF ART.

CLASS 1.—OIL PAINTINGS.

ALLEN, THOMAS, born at St. Louis, Mo.
1. Cattle.

ALLEN, WILLIAM S., born at New York, N. Y. Masters: Lefebvre, Claude Monet, Bouguereau.
2. Evening by the Lake.

ANDERSON, A. ARCHIBALD, born at New York. Masters: Bonnat, Cormon, and Collin.
3. Portrait of the Right Rev. A. C. Coxe, bishop of western New York.

BACHER, OTTO H., born at Cleveland, Ohio. Masters: Boulanger, Lefebvre, C. F. Duran.
4. Richfield Center, Ohio.

BACON, HENRY, born at Boston, Mass. Master: Cabanel.
5. Astray.

BAIRD, WILLIAM.
6. En Famille.

BARNARD, EDWARD H., born at Belmont, Mass. Masters: Lefebvre, Collin, and Otto Grundman.
7. Pastime in the Middle Age.

BEAUX, Miss.
8. Portrait.

BECKWITH, J. CARROLL, born at Hannibal, Mo. Master: Carolus-Duran. Recompense: Honorable mention, Salon of 1887.
9. A Lady of California.
10. Portrait of William Walton.
11. Portrait of a Child. (Owner, H. W. Poor, New York.)

BELL, EDWARD A., born at New York, N. Y. Master: Edw. A. Bell.
12. Portrait.

BENSON, FRANK W., born at Salem, Mass. Masters: Jules Lefebvre and Gustave Boulanger.
13. In Summer.

BIRNEY, WILLIAM VERPLANCK, born at Cincinnati, Ohio. Masters: Julius Benzur and Wilhelm Lindenschurst, of Munich.
14. Dolce far Niente, representing a Southern colored waiter boy taking his ease during working hours.
15. The Labor Question in the South, representing a colored boy cleaning silverware on a terrace.

BISBING, HENRY S., born at Philadelphia, Pa. Master. M. F. de Vuillefroy.
16. The Siesta on the Beach.

BLACKSTONE, Mrs. SADIE, born at Halifax, Nova Scotia. Masters. Simabildi and de Montaland.
17. Senlisse, Valley of Chevreuse.

BLASHFIELD, EDWIN HOWLAND, born at New York, N.Y. Master: Léon Bonnat.
18. Inspiration. (Owner, Col. H. M. Boies.)
19. Portrait. (Owner, C. E. Wilbur.)

BLUM, ROBERT F., born at Cincinnati, Ohio. Recompense: Gold medal, American Art Association.
20. Venetian Lace Workers.

BOGGS, FRANK M., born at New York, N. Y. Master: M. Gérôme.
21. Saint-Germain des Près. (Owner, M. Diot.)
22. View of Dordrecht. (Owner, M. Diot.)
23. Place de la Bastille, Paris. (Owner, French Government.)

Catalogue of exhibitors—Class 1.

BOYDEN, FREDERICK D., born in Boston, Mass. Masters: Boulanger and M. J. Lefebvre.

24. Pastures at Cape Ann, Massachusetts.

BRANDEGEE, ROBERT B., born at Berlin, Conn. Master: M. Jacquesson de la Chevereuse.

25. Portrait.

BRECK, JOHN L.

26. Autumn.

27. The First Born.

BRICHER, ALFRED T., born at Portsmouth, N. H.

28. On the Rockbound Coast of Massachusetts.

BRIDGMAN, FREDERICK ARTHUR, born at Tuskagee, Ala. Master: J. L. Gérôme. Med. 3d class 1887, 2d class 1878 (E. S.), * 1878.

29. The Pirate of Love.

30. Fête of the Prophet at Oued-el-Kebir (Blidah).

31. Negro Fête at Blidah.

32. Horse Market at Cairo.

33. Portrait of Mme. B.

34. On the House-tops, Algiers.

BRISTOL, JOHN BUNYAN, born at Hillsdale, N. Y. Master: Henry Ary, Hudson, N. Y. Recompense: Medal, Centennial Exposition of 1876.

35. Haying Time, near Middlebury, Vt.

BUTLER, HOWARD RUSSELL—*Continued.* Paris Salon, 1886; "Temple" Marine and Landscape Medal, Philadelphia, 1888.

41. Seaweed Gatherers.

42. Low Tide, Saint Ives, Cornwall, England.

43. Rurales Fording the Yantepec.

BUTLER, GEORGE B., born at New York, N. Y.

44. Portrait of Mrs. Stimson.

45. Tambourine Players.

CARR, LYELL.

46. Good Luck.

CAULDWELL, LESLIE GIFFEN, born at New York, N. Y. Masters: Boulanger, Lefebvre, Carolus-Duran.

47. Portrait of my fencing-master, M. Rougé.

CHAPMAN, CARLTON T., born at New London, Ohio. Student at National Academy of Design and Art Students' League, New York.

48. Early Morning in a Harbor.

CHASE, WILLIAM M.

49. A City Park.

50. Peace.

51. A Bit of Long Island.

52. Stoneyard.

53. Gowanus Bay.

54. Portrait of Mother and Child.

55. Portrait of Mrs. C.

COX, KENYON—*Continued.*
65. Jacob wrestling with the Angel.
66. Portrait of Augustus Saint-Gaudens. (Owner, A. Saint-Gaudens.)
67. Flying Shadows.

CURTIS, RALPH.
68. View at Venice.

DANA, WM. P. W., born at Boston, Mass. Master: Eugéne Le Poittevin, Med. 3d cl. 1878, Exp. Univ.
69. Christ walking on the Sea.
70. Hay Barges on the Thames.
71. Calm Evening on the Thames.
72. A Good Breeze, moonlight effect.

DANNAT, WILLIAM T. Master: M. Munkacsy, Medal, 3d class, 1883.
73. A Quartette.
74. A Sacristy in Aragon.
75. Portrait of Miss H.
76. Mariposa.
77. A Study in Red.
78. Une Saducéenne.

DARLING, WILDER M., born at Sandusky, Ohio. Masters: Cormon and H. Mosler.
79. Grandma's First Visit.

DAVIS, CHARLES H., born at Amesbury, Mass. Masters: Boulanger and Lefebvre.
80. A Winter Evening.
81. The Valley. (Evening.)
82. The Hillside.
83. Evening after the Storm.

DELACHAUX, LEON D.
84. Portrait of Mlle. H.
85. Engaging Servants in the Olden Times.

DENMAN H., born at Brooklyn, N. Y. Master: Carolus-Duran. Honorable Mention, Paris Salon, 1886.
86. Offering to Aphrodite. (Owner, Mrs. Wallace.)

DEWING, THOS. W., born at Boston, Mass. Masters: Lefebvre and Boulanger.
87. Lady in Yellow. (Owner, Mrs. J. Gardner.)

DODGE, WM. L., born in Virginia. Masters: Gérôme, Collin, Courtois.
88. David.

DODSON, SARAH, P. B.
89. Morning Stars.
90. Meditation of the Holy Virgin.

DOLPH, JOHN H., born at Fort Ann, N. Y. Master: Louis VanKuyck, of Antwerp.
91. The Rat retired from the World.

DONOHO, G. RUGER, born at Churchill, Miss. Masters: Boulanger, Lefebvre, Bouguereau, and Fleury.
92. La Marcellerie.
93. The Edge of a Forest.

DOW, ARTHUR W., born at Ipswich, Mass. Masters: Boulanger, Lefebvre, Doucet and Paul Delance.
94. At Evening.

DYER, CHARLES GIFFORD.
95. On the Riva; Venice.
96. San Giorgio, seen from the Giudecca; Venice.

EAKINS, THOMAS.
97. Portrait, Professor Geo. H. Barber.
98. The Dancing Lesson.
99. The Veteran (portrait of Geo. Reynolds).

EATON, C. HARRY, born near Akron, Ohio.
100. Landscape. (Owner, W. T. Evans.)

EATON, WYATT, born in Canada. Master: Gérôme.
101. Portrait of Miss M. G. R. (Owner, Mrs. S. Reed.)
102. Portrait of Mrs. R. W. G. (Owner, R. W. Gilder.)
103. Portrait of Man with Violin. (Owner, T. Cole.)
104. Ariadne. (Owner, W. T. Evans).

FARNY, HENRY F., born at Cincinnati, Ohio.
105. Danger. (Owner, A. Howard Hinkle.)

FISHER, MARK.
106. Winter Fare.
107. A Ford: Valley of the Teste.

FORBES, CHARLES F.
108. Portrait of Mlle F. F.
109. Portrait.

FOWLER, FRANK, born at Brooklyn, New York. Masters: Carolus-Duran and Cabanel.
110. At the Piano.

FREER, FREDERICK W., born at Chicago, Ill. Student at Royal Academy of Fine Arts, Munich.
111. Nude Study.

Catalogue of exhibitors—Class 1.

FULLER, GEO., born 1822, died 1884.

112. The Quadroon. (Owner, Mrs. S. D. Warren.)

GARDNER, MISS ELIZABETH JANE, born at Exeter, N. H. Masters: Bouguereau and Lefebvre. Medal, 3d class, 1886.

113. Too Imprudent.

114. The Farmer's Daughter.

GAUL, GILBERT, born at Jersey City, N. J.

115. Charging the Battery. (Owner, W. T. Evans.)

116. The Wounded Officer.

GAY, EDWARD, born in Ireland. Masters: Jas. M. Hart and Geo. H. Boughton. Recompense: Prize of $2,000 American Art Association, New York.

117. The Old Boundary Line.

GAY, WALTER, born at Boston, Mass. Master: Bonnat. Medal, 3d class, 1888.

118. Charity.

119. Le Benedicite (M. I. P. & B. A.).

120. The Weaver.

121. The Spinners.

122. The Bookworm.

123. A Dominican.

GIFFORD, ROBERT SWAIN, born at Naushon Island, Mass. Master: Albert Van Beest. Recompenses: Centennial Medal and American Art Asso-

GUISE, MARIE, born at New York, N. Y. Master: Schenck.

133. Haying-time in Ecouen, France.

GUTHERZ, CARL, born in Switzerland. Masters: Boulanger, Lefebvre.

134. Lux incarnationis.

135. Memorialis.

HAAS, MAURITS F. H. DE, born at Rotterdam, Holland. Master: Louis Meyer. Recompenses: Medal Centennial Exposition of 1876, and medals from Boston, Cincinnati, etc.

136. On the Fishing Ground.

HAMILTON, E. W. D.

137. Sandy Plains at Cape Ann, Mass.

HAMILTON, HAMILTON.

138. A September Day.

HARRISON, ALEXANDER, born at Philadelphia, Pa. Masters: Bastien Lepage and M. Gérome.

139. Castles in the Air. (Owner, J. G. Johnson.)

140. The Amateurs. (Owner, Chicago Art Institute.)

141. Twilight. (Owner, St. Louis Museum of Fine Arts.)

142. The Wave.

143. In Arcadia.

144. Evening.

HARRISON, BIRGE, born at Philadelphia, Pa.

145. Novembre, Property of French

HEALY, G. P. A.—*Continued.*
155. Lord Lytton.
156. King of Roumania.
157. Study at the Harp.
158. Stanley.
159. Portrait of M. Brownson.

HENNESSY, WILLIAM J., born in Ireland.
160. Shrimp Fishers in Normandy.
161. Expiation Pilgrimage, Calvados.

HENRY, EDWARD L., born at Charleston, S. C. Master: Paul Weber. Recompenses: Medals, New Orleans and Chicago.
162. One Hundred Years Ago.
163. The Latest Village Scandal.

HINCKLEY, ROBERT, born at Boston, Mass. Master: Carolus-Duran.
164. Portrait of Mr. Clifford Richardson.

HITCHCOCK, GEORGE, born at Providence, R. I. Masters: Boulanger, Lefebvre, Mesdag.
165. Tulip Culture. (Owner, W. H. Tailor.)
166. Annonciation.
167. Maternity.

HOVENDEN, THOMAS, born in Ireland. Master: Cabanel.
168. Last Moments of John Brown. John Brown leaving the jail on the morning of the execution. (Owner, Mr. Robbins Battell.)

HOWE, WILLIAM H., born at Ravenna, Ohio. Masters: de Thoven and de Vuillefroy. Med. 3d cl., 1888.
169. At Rest: September in Normandy.
170. The Return of the Cows: Evening in Normandy.
171. Departure for the Market: Souvenir of Holland.

HOWLAND, ALFRED C., born at Walpole, N. H. Masters: Flamm of Dusseldorf, and Lambinet of Paris.
172. A Day in June.

HUNTINGTON, DANIEL, born at New York, N. Y. Masters: S. F. B. Morse and G. F. Ferrero. Recompense: 1st class medal, Centennial Exposition, 1876.
173. A Burgomaster of New Amsterdam (New Amsterdam was the original name of New York).

HYDE, W. H.
174. The First *Romance*.

INNESS, GEORGE.
175. A Short Cut to Wachung Station. (Owner, American Art Association.)

IRWIN, BENONI.
176. An Art Votary.

ISHAM, SAMUEL, born at New York, N. Y. Masters: Jacquessen de la Chevereuse, Boulanger, and Lefebvre.
177. Study for a Portrait.

JOHNSON, EASTMAN, born in Maine.
178. Two Men.

JONES, H. BOLTON.
179. The Old Pasture.

KAVANAGH, JOHN, born at Cleveland, Ohio. Masters: Loefftz, Boulanger, Cormon.
180. Washerwomen.
181. Woman of Scheveningen.
182. Shepherd.

KELLOG, Miss ALICE D., born at Chicago, Ill. Masters: Boulanger, Lefebvre, Courtois.
183. Portrait of Miss G. E. K.

KING, LOUISE HOWLAND, born at San Francisco, Cal. Student of Academy of Design and Art Students' League.
184. The Lotos Eaters.

KLUMPKE, Miss ANNA E., born at San Francisco, Cal. Masters: T. Robert-Fleury, Bouguereau, and de Vuillefroy.
185. Portrait.

KLYN, CHARLES F. DE, born at Tarrytown, N. Y. Masters: J. Lefebvre and Cormon.
186. Women Chatting.
187. A Ray of Sunlight.

KNIGHT, DANIEL RIDGWAY, born at Philadelphia. Masters: Gleyre and Meissonier. Hon. Men., Paris, '82; Med. 3d class, Paris, '88; Gold med. 2d class, Munich, '88.
188. Mourning.
189. Hailing the Ferryman.
190. The Meeting.

KOEHLER, ROBERT, born at Hamburg. Masters: Defregger and Loefftz.
191. The Strike.

LA CHAISE, EUGENE A., born at New York, N. Y. Masters: G. Boulanger and Lefebvre.
192. Souvenirs of Japan.

LASAR, CHARLES, born at Johnstown, Pa. Master: M. Gérôme.
193. On the Coast of Britany.

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LASH, LEE, born at San Francisco, Cal. Masters: Boulanger and M. J. Lefebvre.

194. The Death-Watch.

LOCKWOOD, ROBERT W., born at Wilton, Conn. Masters: Schenek and Lafarge.

195. Portrait of M. C.

LOOMIS, EURILDA Q., born at Pittsburgh, Pa. Masters: Boulanger and Lefebvre.

196. Rustic Life in Picardy.

LORING, FRANCIS WILLIAM, born at Boston, Mass.

197. Autumn in the Valley of the Arno.

LYMAN, JOSEPH, born at Ravenna, Ohio.

198. On the Beach (at Percé, Canada).

MCENTEE, JERVIS, born at Rondout, N.Y.

199. Clouds.

200. A Kaatskill River (Owner, J. C. Cornell).

201. Shadows of Autumn. (Owner, W. P. Eno.)

MACEWEN, WALTER, born at Chicago, Ill.

202. Returning from Work.

203. A Ghost Story.

204. Stad Herberg, Nieuw Amsterdam (New York) 1650.

MACY, WILLIAM S., born at New Bedford, Mass.

205. The Shore of Meacham Lake.

MILLER, CHARLES HENRY—*Continued.* Academy of Design and Royal Academy of Bavaria. Recompenses: Gold medals, Boston, New Orleans, and Philadelphia.

214. A Bouquet of Oaks, near Jamaica, Long Island, N. Y.

MINOR, ROBERT C.

215. Close of Day. (Owner, W. T. Evans.)

MOELLER, L.

216. A Doubtful Investment.

MONKS, ROBERT HATTON, born at Boston, Mass. Masters: Bouguereau and T. Robert-Fleury.

217. A Grey Day.

MOORE, H. HUMPHREY.

218. Japanese Views.

219. Japanese Views.

220. Japanese Views.

MORAN, EDWARD, born at Bolton, England. Masters: James Hamilton and Paul Weber. Recompenses: Medal, Palette Club, Centennial Exposition, 1876.

221. New York City from the Channel.

MOSLER, HENRY, born at New York. Master: M. Hébert. Med. 3d cl. 1888.

222. The Last Sacraments. (Owner, Louisville Polytechnic Association.)

223. Harvest Festival. (Owner, Mrs. Haydock, Cincinnati.)

PARTON, ARTHUR, born at Hudson, N. Y.
233. In the Month of May. (Owner, W. T. Evans.)
234. Winter on the Hudson. (Owner, American Art Association.)

PATRICK, J. DOUGLAS.
235. Brutality.

PEARCE, CHARLES SPRAGUE, born at Boston, Mass. Master: M. Bonnat. Honorable mention, Salon 1881, 3d cl. gold med. 1883. Gold med. 2d cl. 1888, Munich; grand med. of honor, Ghent, 1888.
236. Shepherdess.
237. Evening.
238. Portrait of Mme. P.
239. Melancholy.

PEARCE, LOUISE CATHERINE, born at Paris, France. Master: Charles Sprague Pearce.
240. Japanese Knickknacks.

PERRY, Jr., E. WOOD, born at Boston, Mass. Master: T. Couture.
241. Mother and Child.

PETERS, CLINTON, born at Baltimore, Md. Masters: Boulanger, Lefebvre, Gérôme, Collin.
242. Portrait of Dr. G. J. B.

PLUMB, HENRY G., born at Sherburne, N. Y. Master: Gérôme.
243. The Orphans.

PORTER, BENJAMIN CURTIS, born at Melrose, Mass.
244. Portrait of a Lady. (Owner, Mrs. Charles Berryman.)

POTTHAST, EDWARD, born at Cincinnati, Ohio. Master: M. Cormon.
245. Study: A Young Brittany Girl.

REID, ROBERT.
246. Study.

REINHART, CHARLES STANLEY, born at Pittsburgh, Pa.
247. Washed Ashore.
248. Awaiting the Absent.
249. Rising Tide.
250. An Old Woman.
251. The Sea.
252. Fog Effect.

REMINGTON, FREDERICK, born at Canton, N. Y.
253. A Lull in the Fight. Descriptive of an affair on the Staked Plain (Texas), in 1861, as told by a Comanche "brave" who participated.

RENOUF, A. VINCENT, born at New York. N. Y. Masters: Max Thedy and Frillhof Smith.
254. Portrait.

RICE, WILLIAM, M. J., born at Brooklyn, N. Y. Masters: Carolus-Duran and J. Carroll Beckwith.
255. Portrait.

RICHARDS, SAMUEL, born at Spencer, Owen County, Indiana. Masters: Stræhuber, Benczur, Gysis, Loefftyz.
256. Evangeline.

RICHARDS, WILLIAM T., born at Philadelphia, Pa.
257. After a Storm.

ROBBINS, HORACE W., born at Mobile, Ala. Master: James M. Hart.
258. A Mountain Road.

ROBINSON, THEODORE.
259. The Bread Carrier.
260. The Forge.

RYDER, PLATT P., born at Brooklyn, N. Y. Master: Léon Bonnat.
261. A Game at Marbles. (Owner, W. T. Evans.)

SARGENT, JOHN S., born at Florence, Italy. Master: M. Carolus-Duran, 2d med. Salon, Paris.
262. Portrait of the Misses B.
263. Portrait of Mrs. W.
264. Portrait of the Misses V.
265. Portrait of Mrs. R.
266. Portrait of Mrs. S.
267. Portrait of Mrs. K.

SAWYER, R. D., born at Watertown, N. Y. Masters: Boulanger and Lefebvre.
268. A Normandy Idyl.

SHERWOOD, ROSINA EMMET, born at New York, N. Y. Master: Wm. M. Chase.
269. Portrait. (Owner, J. N. A. Griswold.)

SHIRLAW, WALTER, born in Scotland.
270. Rufina.

SIMMONS, EDWARD EMERSON, born at Concord, Mass. Masters: Boulanger and M. J. Lefebvre.
271. The Farmer.
272. Night.
273. Study.

SMITH, DE COST, born at Skaneateles, N. Y. Masters: Boulanger, Lefebvre, Beckwith, etc.
274. Conflicting Faiths, representing an Iroquois holding a Shamanic

Catalogue of exhibitors—Class 1.

SMITH, DE COST—*Continued.*
mask, symbolizing paganism, and a priest with a rosary, symbolizing Christianity during the period of the French Jesuit missions among the Iroquois in Canada in the eighteenth century.

SONNTAG, WILLIAM L., born at Cincinnati, O.
275. A Mountain Stream from the Foot of Mt. Carter, N. H.

STEWART, JULIUS L., born at Philadelphia, Pa. Masters: Zamacoïs, Gérôme, and R. de Madrazo.
276. A Court at Cairo.
277. The Seine at Bougival.
278. A Hunt Ball.
279. A Hunt Supper.
280. Portrait of the Baroness B. M.
281. Portrait of the Baroness de B.

STOKES, FRANK WILBERT, born at Nashville, Tenn. Masters: Boulanger, Gérôme, and J. Lefebvre.
282. The Orphans.
283. A Good Sermon.

STORY, JULIAN RUSSELL, born at Walton-on-Thames, England.
284. The Black Prince finding the Dead Body of the King of Bohemia, after the battle of Crecy (1346).
285. Portrait; reign Louis XVI.
286. Portrait of my Father.

THROOP, FRANCES HUNT, born at New York, N. Y. Masters: J. Carroll Beckwith and Alfred Stévens.
292. Portrait of Miss C.

TIFFANY, LOUIS C., born at New York, N. Y.
293. Carrying the Boat at Seabright.

TOMPKINS, FRANK H., born at Hector, N. Y.
294. Memories.

TRACY, JOHN M.
295. Chesapeake Bay Dog retrieving a Wounded Goose.

TRUESDELL, G. S.
296. The Shepherd and his Flock.

TURNER, CHARLES Y., born at Baltimore, Md. Masters: J. P. Laurens, M. Munckacsy, Léon Bonnat.
297. The Days that are No More.

TYLER, JAMES G., born at Oswego, N. Y. Master: A. Cary Smith.
298. Off Cape Ann.

ULRICH, CHARLES F.
299. In the Land of Promise. (Owner, W. T. Evans.)

VAIL, EUGENE L., born at St. Malo, France. Masters: Cabanel, Collin, Dagnan-Bouveret. Med. 3d cl. 1888.
300. Ready About.
301. Fishing Harbor.
302. The Widow.
303. On the Thames.

VAN BOSKERCK, ROBERT W., born in

WALKER, HORATIO.
315. A Stye.

WARD, EDGAR M., born in Ohio.
316. The Tack Workers.
317. The Rest.

WEBB, J. LOUIS, born in Washington, D. C. Master: W. M. Chase.
318. A Studio Corner.

WEEKS, E. L., born at Boston, Mass. Master: M. Bonnat.
319. The Last Journey; Souvenir of the Ganges.
320. Hindoo Marriage Procession; Ahmedabad.
321. The Rajah of Jodhpare.
322. Sacred Lake: Study.
323. The Mosque of Vazin Khan, Lahore; Study.

WEIR, J. ALDEN, born at West Point, N.Y. Master: G. L. Gérôme. Recompense: Honorable Mention. Paris Salon '82.
324. Preparing for Christmas.
325. Lengthening Shadows. (Owner, W. T. Evans.)
326. Portrait of Artist's Child.

WHITEMAN, SAMUEL EDWIN, born at Philadelphia, Penn. Masters: Boulanger and M. J. Lefebvre.
327. Moonrise.

WHITTREDGE, WORTHINGTON, born in Ohio. Recompense: 1st class Medal, Centennial Exposition, 1876.
328. The Old Road to the Sea. (Owners. Messrs. Pettus and Curtis.)
329. A Brook in the Woods.

WICKENDEN, ROBERT JOHN, born at Rochester, England. Masters: Carroll Beckwith, Chase, Hébert, and Merson.
330. Noon.

WIGHT, MOSES, born at Boston, Mass. Masters: Hébert and Bonnat.
331. Portrait of Mrs. W.

WILES, IRVING R., born at Utica, N. Y. Master: Carolus-Duran.
332. Portrait of a Lady.

WITT, J. H.
333. Planning an Apple Cutting.

WOOD, OGDEN, born at New York, N. Y. Masters: School of Fine Arts and M. Van Marcke.
334. Pasture at the Sea-Side.

WOOD, THOMAS WATERMAN, born at Montpelier, Vt.
335. The Difficult Text. (Owner, T. N. Vail.)

WYANT, ALEXANDER H., born in Ohio. Master: Gude.
336. Landscape. (Owner, C. H. de Silver.)

CLASS 2.—PAINTINGS OF DIFFERENT KINDS, AND DRAWINGS.

ABBEY, EDWARD A., born in Philadelphia, Pa.
337–342. A Love Song. (Six pieces.)
343. Why can'st thou not as others do?
344, 345. With Jockey to the Fair. (Two pieces.)
346, 347. Harvest Home. (Two pieces.)
348, 349. Phillada. (Two pieces.)
350, 351. Sally in our Alley. (Two pieces.)
352. Never loved thee more.

BLASHFIELD, EDWIN HOWLAND, born at New York, N. Y. Master: Léon Bonnat.
353. Chivalry. (Owner, Century Co,)
354. The Gladiators. (Owner, Century Co.)
355. The Vigil at Arms. (Owner, Scribner's Magazine.)
356. The Angels in the Miracle Play. (Owner, Scribner's Magazine.)

BLUM, ROBERT F., born at Cincinnati, Ohio. Recompense: Gold medal, American Art Association.
357. The Modern Etcher.
358. The Ballet Girls.
359. Table d'Hôte.
360. Part of an Old Story. (Owner, The Century Co.)

COX, KENYON, born at Warren, Ohio. Masters: J. L. Gérôme and Carolus-Duran.
361. Bust of J. A. Weir.
362. Portrait Bust.
363. Follower of St. Joseph.
364. Reading in the Chapter Room.
365. In the Smithy.
366. At Work.

COXE, REGINALD CLEVELAND, born in Baltimore, Md. Master: Léon Bonnat.
367. Gloucester Harbor.

Catalogue of exhibitors—Class 2.

COXE, REGINALD CLEVELAND—*Cont'd.*
368. Passing Squall.
369. Return of the Feet.
370. In the Narrows.

DRAKE, WILLIAM H., born at New York, N. Y. Student at Art Students' League, New York, N. Y.
371. Rippling Waters, representing a forest stream.
372. Excursion Party. (Owner, Century Co.)
373. The Two Friends. (Owner, Century Co.)
374. A Fishing Party. (Owner, Century Co.)
375. Washington's Escape. (Owner, Century Co.)

FARRER, HENRY.
376. Moonrise.

FOOTE, MARY HALLOCK, born at Orange County, N. Y.
377. Cinching up. (Owner, Century Co.)
378. Looking for Camp. (Owner, Century Co.)

GIBSON, M. HAMILTON.
379. Afternoon Pastorale.
380. An Upland Runnell.
381. My Backyard Oasis.
382. An Evening Primrose.
383. The Penitent.

GREATOREX, Miss ELIZA, born in Ireland.
384. St. Malo: Crypt at Mount St.

LOW, WILLIAM H.
392. Ode and Sonnets.
393. Ode to Melancholy.
394. Ode to Psyche.
395. Ode on a Grecian Urn.
396. Bards.
397. Shut from the Busy World of more incredulous.
398. The Guarded Nymph.
399. Into the Green Recess of Wood.
400. By a Clear Pool.
401. She bathes unseen.
402. The Flight of Lamia.
403. Last Sonnet of Keats.

MORAN, THOMAS, born at Bolton, England. Master: Jas. Hamilton. Recompense, Medal 1st cl., Centennial Exposition, 1876.
404. Mount of the Holy Cross.

NICOLL, JAMES CRAIG, born at New York, N. Y. Master: M. F. H. de Haas. Recompenses, First class, New Orleans Exposition, etc.
405. Night.

PENNELL, JOSEPH.
406. Christ Church Gateway, Canterbury.
407. Exchequer Gate, Lincoln Cathedral.
408. Lincoln Cathedral.

PLATT, C. A.
409. Quai at Honfleur.

REDWOOD, A. C.

[redacted]

REINHART, CHAS. S.—*Continued.*
428. What sort of Weather?
429. Electric Shock.
430. A Kissing-Gate.
431. The Five o'clock Tea.
432. The Reichstag. (Group of Sketches.)

REMINGTON, FREDERICK, born at Canton, N. Y.
433. An Episode, Opening up a Cattle Country.
434. A Deep Ford.
435. Cutting out a Steer.
436. Broncos and Timber Wolves.

RICHARDS, WILLIAM T., born at Philadelphia, Pa.
437. Headlands, Narragansett Bay.

ROLSHOVEN, JULIUS.
438. Water-Carrier; Venice.
439. Portrait of Miss R.
440. A Good Cigarette.

SHERWOOD, ROSINA EMMET, born at New York, N.Y. Master: Wm. M. Chase.
441. September.
442. Phyllis.

SMITH, F. HOPKINSON.
443. Near Neighbors at Ulm.
444. A Dutch Canal.

STEWART, JULIUS L., born at Philadelphia, Pa. Masters: Zamacois, Gérôme, and R. de Madrazo.
445. Portrait of Mrs. B.
446. Portrait of Miss S.

WICKENDEN, ROBERT JOHN, born at Rochester, England. Masters: Carroll Beckwith, Chase, Hébert, and Merson.
447. Côtes Fleuries (Isle of Jersey.)

WEIR, J. ALDEN, born at West Point, N. Y. Master: G. L. Gérôme. Recompense, Honorable Mention, Paris Salon 1882.
448. Consolation.
449. Still Life. (Owner, H. C. Howells.)

WHITTEMORE, WILLIAM J., born at New York, N. Y.
450. October.

WILES, IRVING R., born at Utica, N. Y. Master: Carolus-Duran.
451. Sewing Class.
452. Modeling Class.
453. Negative Retouching Class.

CLASS 3.—SCULPTURE AND ENGRAVINGS ON MEDALS.

ADAMS S. HERBERT, born at West Concord, Vt. Master: M. A. Mercié. Recompense: Honorable Mention, Salon, 1888.
454. Young girl; bust, plaster.

BARTLETT, P. W., born at New Haven, Conn. Masters: Frémiet, Cavelier, Gaudez. Recompense: Honorable Mention, Salon, 1887.
455. Bohemian; Bronze.

FRENCH, DANIEL C.
456. Bronze Bust of Ralph Waldo Emerson.

HELD, CHARLES, born in the Canton of Geneva, Switzerland. Master: Charles Held.
457. In Glass Case:
President Carnot; Actrice; Egyptian Woman; Landscape in Auvergne; Hunting Dogs; Renaissance Flowers.

KITSON, H. H., born at Huddersfield. Master: Bonnassieux.
458. Mayor Doyle; statue, plaster.
459. Miss R.; bust, marble.

MAC MONNIES, FREDERICK, born at Brooklyn, N. Y. Masters: Saint-Gaudens, Falguière, and Mercié.
460. Medallions; plaster.

RUGGLES, Miss THEO. A., born at Brookline, Mass.
461. Bust of a Child; bronze.
462. On the Shore of the Oise; plaster.

STORY, WALDO, born at Paris, France.
463. The Fallen Angel; group, marble.

STORY, WM. W., born at Salem, Mass.
464. Salomé; marble statue.

WARNER, OLIN L., born at Suffield, Conn. Master: Joutfroy.
465. Bronze Bust of J. Alden Weir.
466. Small Bronze Bust of Mr. Daniel Cottier.
467. Marble Bust of Baby Rosalie Warner.
468. Three bronze medallion portraits.

WUERTZ, EMILE, born at New York, N. Y. Masters: A. Mercié and A. Rodin.
469. Medallion; plaster.

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CLASS 4.—ARCHITECTURAL DRAWINGS AND MODELS.

McKIM, MEAD & WHITE, 57 Broadway, New York, N. Y.

470. Perspective of Bates Hall (reading-room), New Public Library, Boston, Mass.

CLASS 5.—ENGRAVINGS AND LITHOGRAPHS.

AMERICAN SCHOOL OF WOOD ENGRAVING. COLLECTIVE EXHIBIT.

AIKMAN, W. M., New York.

471. Sheep.
472. Landscape, by Parsons.

BERNSTROM, VICTOR, New York.

473. Port Neuf.
474. The Spoils.
475. The Dead Matador.
476. The Otter Hunt.
477. Music Party.
478. Retribution.
479. The Mystery of Life.

CLOSSON, W. B., Boston, Mass.

480. Golden Rod.
481. Paolo and Francesca.
482. Study of Head, by Fuller.
483. Subject by Mary Hallock Foote.
484. Still Life, by L. Bouvier.
485. The Listeners.
486. The Quadroon Girl.

COLE, T., New York.

JOHNSON, T., New York.

506. Portrait of a Child.
507. Alphonse Daudet.
508. Head of a Man, by Rembrandt.
509. Lord Alfred Tennyson.
510. Æsop, by Velasquez.
511. Pasteur and Granddaughter.

KING, F. S.

512. Knowledge is Power.
513. A Difference.
514. The Sybil.

KINGSLEY, ELBRIDGE, New York.

515. Birch Trees.
516. Landscape, Diaz.
517. Midsummer, Daubigny.
518. Morning.
519. The Flying Dutchman.

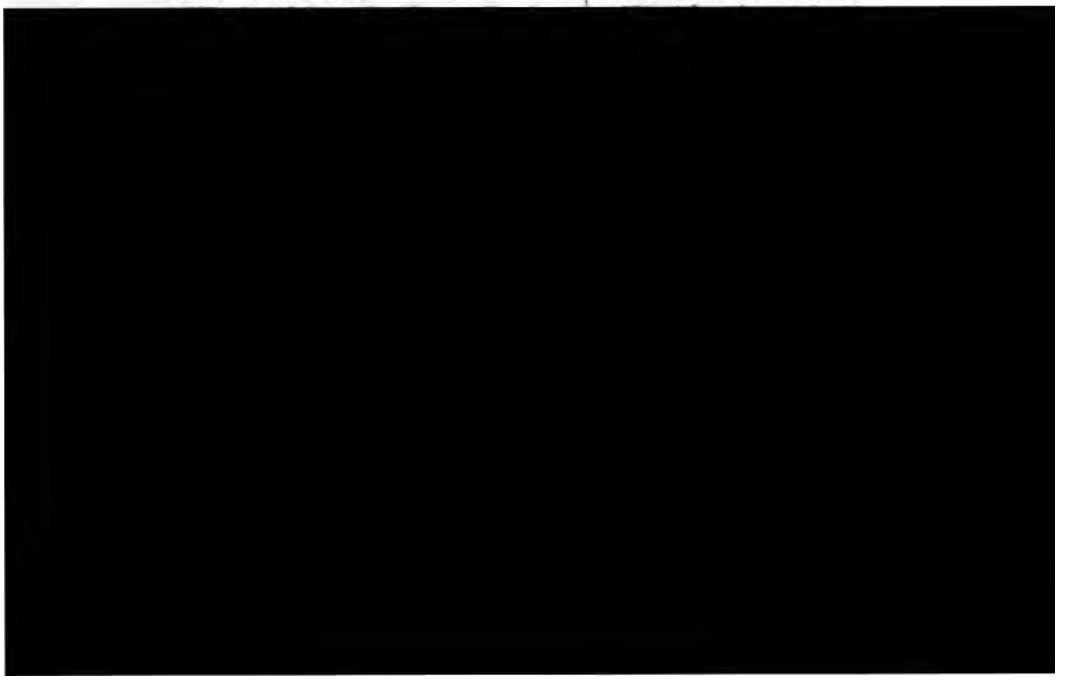
KRUELL, G., New York.

520. A Russian Jew.
521. A Russian Peasant.
522. Coaxing the Chief.
523. A Soul Drama.
524. Darwin.
525. Lincoln.
526. Rent Day.
527. A Portrait.

LINDSY, ALBERT M., Philadelphia.

528. Neighbors on the Terrace.
529. Presentation of a Circus to a Spanish Town.
530. Discovery of Gold in Australia.

MULLER, R., New York.



STANDENBAUR, R., New York.
549. General Grant.
550. General Lew Wallace.
551. Chauncey M. Depew.
552. Dr. Taylor.

TINKEY, J., New York.
553. Exchanging Confidences.
554. In the New Forest.
555. The Beaver Dam.
556. Sleeping Poppies.
557. Springhaven.

VARLEY, ROBERT, New York.
558. The Bells of St. Anne.
559. The Rehearsal.
560. The Burial Ground.

WELLINGTON, F., New York.
561. A Day in June.
562. Capture of Grenada.
563. Amélie Rives.
564. A May-Day Idyl.
565. Pinks, L. Bouvier.
566. Still Life, L. Bouvier.
567. Miles Standish's Challenge.

WOLF, HENRY, New York.
568. David.
569. Owl Catching a Mouse.
570. Wood Interior.
571. The Roadside.
572. A New England Peddler.

GROUP 2.—EDUCATION AND INSTRUCTION—APPARATUS AND PROCESSES USED IN THE LIBERAL ARTS.

CLASS 6.—EDUCATION OF YOUNG CHILDREN.—PRIMARY INSTRUCTION.—INSTRUCTION OF ADULTS.

ABINGTON PUBLIC LIBRARY, Abington, Mass.
One catalogue and eleven supplements. Reports from 1884 to 1888 inclusive.

ACADEMY, (The) Syracuse, N. Y.
Reports and catalogues.

ADMINISTRATION BLANKS AND FORMS.
Collective exhibit from the States of Alabama, California, Florida, Illinois, Iowa, Kansas, Louisiana, Minnesota, Missouri, Oregon, South Carolina, West Virginia, and Wisconsin; and from the towns of Auburn, N. Y.; Chambersburgh, Pa.; Dubuque, Iowa; Evansville, Ind.; Haverhill, Mass.; Memphis, Tenn.; New Bedford, Mass.; Newport, Ky.; Omaha, Neb.; Sandusky, Ohio; Somerville, Taunton, and Woburn, Mass.

AMERICAN ASYLUM FOR THE EDUCATION OF THE DEAF AND DUMB, Hartford, Conn., Job Williams, principal.
Copies of 71st and 72d annual reports.

BACON, G. A., Syracuse, N. Y.
Current numbers of the Academy.

BALTIMORE (MD.) PUBLIC SCHOOLS, Henry A. Wise, superintendent.
Six volumes of reports of the superintendent of public schools. Three volumes of rules for school commissioners. The public school directory. Blanks used in the administration of the school.

BANGOR LIBRARY, Bangor, Me., Daniel Holman, librarian.
Librarian's report, catalogue, rules and regulations, and blanks of administration.

BARDEEN, C. W., Syracuse, N. Y. (686.)
Volumes of The Schoolroom, The School Bulletin, and The New Education; text-books, memory cards, and cube-root blocks. (349.)

BARNES, A. S. & Co., 111 William street, New York City.
Books.

BEARDSLY LIBRARY, West Winsted, Conn., Miss Louise M. Carrington, librarian.
The Report of the Librarian; catalogues of books and supplement; blanks of administration.

BERKELEY SCHOOL, New York City.
One relief map, showing Cæsar's campaigns; three maps showing a valley of erosion by contour lines, by sawed wood, and by clay models. (341.)

BETZ, CARL, Kansas City, Mo.
Text-books and apparatus for gymnastics.

BOARD OF EDUCATION, Brooklyn, N. Y. Calvin Patterson, superintendent.
Annual Report of the Superintendent for 1887; scholars' work; writing books and drawing books.

BOARD OF EDUCATION, Grand Rapids, Mich., F. M. Kendall, superintendent.
Volume of annual reports; two pamphlets on physiology and hygiene for the public schools; special geography of Michigan; general blanks of administration.

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Catalogue of exhibitors—Class 6.

BOARD OF EDUCATION OF WISCONSIN, Madison, Wis. J. B. Thayer, State superintendent.

One volume of school laws and one volume of laws relating to school libraries; proceedings of the board of regents of normal schools; report of the board of regents for the University of Wisconsin; two catalogues of public school libraries; annual catalogues of the University of Wisconsin; annual catalogues of the State normal schools at River Falls, Milwaukee, Platteville, Oshkosh, and Whitewater, Wisconsin; report of the State superintendent for 1887 and 1888; blanks of administration.

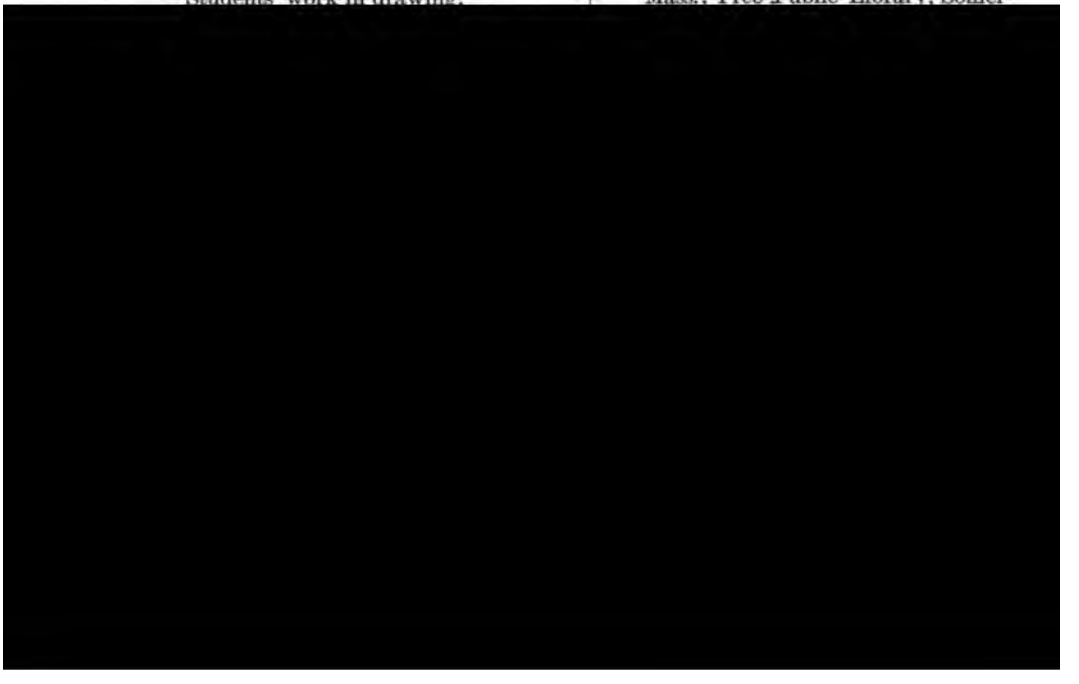
BOSTON (Mass.) PUBLIC SCHOOLS. Calvin P. Seaver, superintendent.

Plaster casts; paintings; portfolios of drawings; text and reference books; volumes of copy books; map of Boston; charts of courses of study; one set of Prang's drawing models; one school globe; music charts; portfolios of needlework; plates of drawings from the Free Evening Industrial School; volumes of reports, and one school desk and chair.

BRISTOL (PA.) PUBLIC SCHOOLS.

Students' work in drawing.

CATALOGUES OF LIBRARIES. Collective exhibit from Abington Public Library, Abington, Mass.; Bangor Library, Bangor, Me.; Beardsley Library, West Winsted, Conn.; Belleville Public Library, Belleville, Ill.; Boston and Albany Railroad Library, Springfield, Mass.; Boynton Public Library, Templeton, Mass.; Broadbrook's Free Library, Harwich, Mass.; Buffalo Public Library, Buffalo, N. Y.; Chicago Law Institute, Chicago, Ill.; Coldwater Public Library, Coldwater, Mich.; Dayton Public Library, Dayton, Ohio; Douglass Library, Canaan, Conn.; Edward L. Pierce Library, St. Helena Island, South Carolina; Enoch Pratt Free Library, Baltimore, Md.; Fay Library, Southborough, Mass.; Fiske Free Library, Claremont, N. H.; Franklin Typographical Society, Boston, Mass.; Free Public Library, Burlington, Iowa; Free Library, Alameda, Cal.; Free Public Library, Auburn, Mass.; Free Public Library, Hopedale, Mass.; Free Public Library, Norton, Mass.; Free Public Library, Omaha, Neb.; Free Public Library, Portland, Oregon; Free Public Library, Sutton, Mass.; Free Public Library, Somer-



CATALOGUES OF LIBRARIES—*Continued.*

Mass.; Odd Fellows' Library Association, San Francisco, Cal.; Orange Public Library, Orange, Cal.; Oswego City Library, Oswego, N. Y.; Poughkeepsie Public Library, Poughkeepsie, N. Y.; Public Library, Ayer, Mass.; Public Library, Bryan, Ohio; Public Library, Chelsea, Mass.; Public Library, Fitchburg, Mass.; Public Library, St. Louis, Mo.; Public Library, Southbridge, Mass.; Public Library, Taunton, Mass.; Public Library, Toledo, Ohio; Public Library, Warren, Mass.; Public Library, West Brookfield, Mass.; Raymond Public Library, Royalston, Mass.; Russel Library, Middletown, Conn.; The Brooklyn Library, Brooklyn, N. Y.; Tuft's Library, Weymouth, Mass.; Waltham Public Library, Waltham, Mass.; Watertown Library Association, Watertown, Mass.; Woburn Public Library, Woburn, Mass.; Woodbury Library, Woodbury, N. J.; and the Young Men's Christian Association, Meriden, Conn.

CATHEDRAL SCHOOL OF ST. PAUL, Garden City, N. Y.

Frames containing photographs of students and buildings, and a diploma: and a portfolio of photographs and forms.

CHAMBERSBURGH (PA.) PUBLIC SCHOOL, W. H. Hockenberry, superintendent.

Annual statement and report of the superintendent, for 1887–'88; blanks used in administration of schools.

CHARLESTON LIBRARY SOCIETY, Charleston, S. C., Miss A. E. Pinckney, librarian.

The constitution and rules and a catalogue of books.

CHAUTAUQUA ASSOCIATION, Chautauqua, N. Y.

A manual of Biblical geography; and a chart showing programme of work.

CHICAGO PUBLIC LIBRARY, Chicago, Ill., Frederick H. Hild, librarian.

One volume, annual reports of directors, 1873–'88; one volume finding lists; one volume bulletins; one volume views, blanks, etc

CHICAGO (ILL.) PUBLIC SCHOOLS, George Howland, superintendent.

Eight annual reports of board of education 1880–'87; report of course of study; physical exercises, etc.

CHRISTIANSEN INSTITUTE, BROOKLYN, N. Y., Mrs. E. C. Staker principal.

Circulars of information and a collection of scholars' work, consisting of 25 cards of maps and drawings; also kindergarten work in paper folding and embroidery.

CITY AND TOWN SCHOOL REPORTS.

Collective exhibit from Auburn, N. Y.; Baltimore, Md.; Binghamton, N. Y.; Boston, Mass.; Bristol, Pa.; Brooklyn, N. Y.; Buffalo, N. Y.; Cambridge, Mass.; Charleston, W. Va.; Chelsea, Mass.; Cincinnati, Ohio; Cleveland, Ohio; Coldwater, Mich.; Columbus, Ohio; Dayton, Ohio; Elizabeth, N. J.; Evansville, Ind.; Fort Worth, Tex.; Galveston, Tex.; Gloucester, Mass.; Grand Rapids, Mich.; Haverhill, Mass.; Indianapolis, Ind.; Jersey City, N. J.; Johnston, R. I.; Kansas City, Mo.; Lawrence, Mass.; Leavenworth, Kans.; Lewiston, Me.; Memphis, Tenn.; Moline, Ill.; New Bedford, Mass.; Newburgh, N. Y.; New Haven, Conn.; Newport, Ky.; New York City; Omaha, Neb.; Oskaloosa, Iowa; Pittsburgh, Pa.; Portland, Oregon; Poughkeepsie, N. Y.; Quincy, Mass.; Rochester, N. Y.; St. Joseph, Mo.; St. Louis, Mo.; St. Paul, Minn.; Salem, Mass.; Sandusky, Ohio; Somerville, Mass.; Springfield, Ill.; Springfield, Mass.; Sutton, Mass.; Taunton, Mass.; Terre Haute, Ind.; Toledo, Ohio; Utica, N. Y.; West Des Moines, Iowa; Williamsport, Pa.; Woburn, Mass.; Worcester, Mass.; Yonkers, N. Y.

CLEVELAND (OHIO) PUBLIC SCHOOLS, L. W. Day, superintendent.

Annual reports of superintendent for 1886 and 1887 courses of study; manuals of the schools.

COLDWATER (MICH.) PUBLIC SCHOOLS AND LIBRARY.

Photographs of buildings and scholars;

Catalogue of exhibitors—Class 6.

COLDWATER (MICH.) PUBLIC SCHOOLS AND LIBRARY—*Continued.*

photographs of library: a programme of study hours; school forms; reports and library catalogue.

COLORADO INSTITUTION FOR THE DEAF AND BLIND, Colorado Springs, Col., D. C. Dudley, A. B., superintendent.

Map of Colorado Springs, seven photographs, descriptive volume and catalogue. Scholars' work: lace, carving, etc.

COLUMBUS (OHIO) PUBLIC SCHOOLS, R. W. Steavenson, superintendent.

Annual reports 1880 to 1888; volumes school laws; cards of committees.

CONVENT OF THE GOOD SHEPHERD, Newport, Ky.

Scholars' work: writing and fancy work.

DAYTON PUBLIC LIBRARY, Dayton, Ohio.

Catalogue of books; pamphlet-dedication; by-laws; report of librarian.

DEPARTMENT OF EDUCATION OF SOUTH CAROLINA, Columbia, S. C., James H. Rice, State superintendent of education.

Volumes of annual reports of the superintendent and one volume of school laws.

DEPARTMENT OF PUBLIC INSTRUCTION OF ARKANSAS, Little Rock, Ark., W. I.

DEPARTMENT OF PUBLIC INSTRUCTION OF FLORIDA, A. J. Russell, State superintendent, Tallahassee, Fla.

School laws; annual reports and catalogues of State Agricultural College; reports of the president of Rollin's College, of the State Normal School for Colored Students, of the Blind and Mute Institute, of the State Normal School for White Students; rules, regulations, and blanks of administration.

DEPARTMENT OF PUBLIC INSTRUCTION OF IOWA, Henry Sabin, superintendent, Des Moines, Iowa.

Volumes of Iowa documents, 1888; volumes of school law decisions, 1888; annual reports; census of Iowa, 1835–18 0 and 1885; volume of the secretary's blank reports, volume of the treasurer's blank reports, and volume of the county superintendent's blank reports; one volume each of agricultural and horticultural reports for 1887; blank certificate, diploma, and general blanks used in administration of the office.

DEPARTMENT OF PUBLIC INSTRUCTION OF MICHIGAN, Lansing, Mich. Reports 1872 to 1882, inclusive; 1884 to 1887, inclusive; 20 blanks of administration; book of teachers' certificates;

DEPARTMENT OF PUBLIC INSTRUCTION OF OREGON—*Continued.*
Volumes of school laws; blanks; "The Resources of Oregon;" reports of the school for deaf mutes; reports of the school for the blind.

DEPARTMENT OF PUBLIC INSTRUCTION OF RHODE ISLAND, Providence, R. I.
Volumes of reports, 1880 to 1888; school manuals; general blanks, and volumes of School Journal.

EDUCATIONAL PUBLISHING COMPANY, Boston, Mass.
Current numbers of The Popular Educator.

ELIZABETH, (N. J.) PUBLIC SCHOOLS, J. A. Dix, superintendent.
One portfolio containing a map of the city, course of study, students' work, and administration blanks.

ENOCH PRATT FREE LIBRARY, Baltimore, Md. Librarian's report, catalogues, and volume of letters and documents.

FINDLEY, SAMUEL, Akron, Ohio. (639)
Current numbers of The Ohio Educational Monthly and National Teacher.

FOOTE, ALBERT EDWARD, 1223 Belmont avenue, Philadelphia, Pa. (798).
Geological maps and reports (see also Class 8).

FORT WORTH, (TEX.) PUBLIC SCHOOLS, Alexander Hogg, superintendent.
A volume by the superintendent, "The Railroad in Education;" scholars' work; reports of the superintendent and blanks of administration.

FREE PUBLIC LIBRARY, Burlington, Iowa, Clara S. Smith, librarian.
Catalogues of books; report of circulation and blanks.

FREE PUBLIC LIBRARY, Topeka, Kans., Olin S. Davis, librarian.
A catalogue of books and binding list; two photographs, and blanks of administration.

FREE PUBLIC LIBRARY, Uxbridge, Mass., Lawson A. Seagrave, librarian.
A bound volume of catalogues, reports, etc.

FRENCH SCHOOL OF THE SOCIETY OF THE HOUSE OF REFUGE, Hudson, N. Y.
Scholars' work.

FRIENDS' FREE LIBRARY, Germantown, Philadephia, Pa., William Kise, librarian.
Committee's reports, catalogues, circulars, blanks of administration, photograph of library.

GALVESTON (TEX.) PUBLIC SCHOOLS.
Six photographs of buildings; 64 photographs of teachers and scholars; 75 papers on mathematics and language written by pupils; charts of statistics; charts of recitation hours; 2 record books; 20 blanks and 50 plates of students' drawings.

GENERAL SOCIETY MECHANICS AND TRADESMEN OF THE CITY OF NEW YORK, Jacob Schwartz, librarian.
A catalogue and finding list for the library; a manual for 1889; annals of the society; an old charter; photographs and statistics; blanks of administration.

HAMPTON PUBLIC LIBRARY, Bridgehampton, N. Y.
Copy of the charter of the library; reports of circulation and finances; specimen blanks.

HARWOOD MANUFACTURING COMPANY, Boston, Mass. (791)
Six samples of chairs for school halls.

HOME FOR FEEBLE-MINDED CHILDREN, Santa Clara, Cal.
Two volumes of work in sewing, one volume of reading, and ten pieces of fancy work made by pupils.

HYATT SCHOOL SLATE COMPANY (The), South Bethlehem, Pa.
Seventy specimens of school slates.

INDIANAPOLIS (IND.) PUBLIC SCHOOLS, L. H. Jones, superintendent.
Reports of superintendent of public schools for 1887-'88; school manual of 1889.

INDIAN INDUSTRIAL SCHOOL, Carlisle, Pa.
Current numbers of The Indian Helper and The Red Man, printed by the Indian boys; 9 photographs of students.

INSTITUTE OF OUR LADY OF THE SACRED HEART, Washington Heights, Ill., Mother Pacific, principal.
Students' work: maps, writing, and free-hand drawing; catalogue and blanks of administration.

Catalogue of exhibitors—Class 6.

IVISON, BLAKEMAN & CO., New York City. (362)

Text-books.

JOURNALS OF EDUCATION.

American Journal of Education, St. Louis, Mo.; American Teacher, Boston, Mass.; Education, Boston, Mass.; Common School Education, Boston, Mass.; Educational Courant, Louisville, Ky.; Educational Gazette, Rochester, N. Y.: Educational News, Philadelphia, Pa.; Florida School Journal, Lake City, Fla.; Illinois School Journal, Bloomington, Ill.; Indiana School Journal, Indianapolis, Ind.; Intelligence, Chicago, Ill.; Journal of Education, Boston, Mass.; Minnehaha Teacher, Sioux Falls, Dak.; National Educator, Allentown, Pa.; Popular Educator, Boston, Mass.; School and Home, St. Louis, Mo.; Southwestern Journal of Education, Nashville, Tenn.; The Academy, Syracuse, N. Y.; The Alabama Teachers' Journal, Cincinnati, O.; The American Teacher, Boston, Mass.; The Educational Journal of Virginia, Richmond, Va.; The Fountain, York, Pa.; The Monthly Pennsylvania School, Williamsport, Pa.; The North Carolina Teacher, Raleigh, N. C.; The

MANUFACTURERS AND MECHANICS' LIBRARY ASSOCIATION—Continued.

A copy each of the constitution, by-laws, catalogue, and blanks used in the administration of the library.

MARIANNA (Ark.) INSTITUTE, Marianna, Ark., Thomas A. Futrall, president.

Catalogues of the school; scholars' work; writing-books.

MECHANICS' LIBRARY, Portland, Me., Hubbard W. Bryant, librarian.

Portfolio of blanks, rules, etc.

MEMORIAL FREE LIBRARY, Mount Airy, Philadelphia, Pa., L. D. Lovett, librarian.

Annual report and a catalogue; statistics and blanks of administration; four photographs.

MERCANTILE LIBRARY, San Francisco, Cal., Alfred E. Whitaker, librarian.

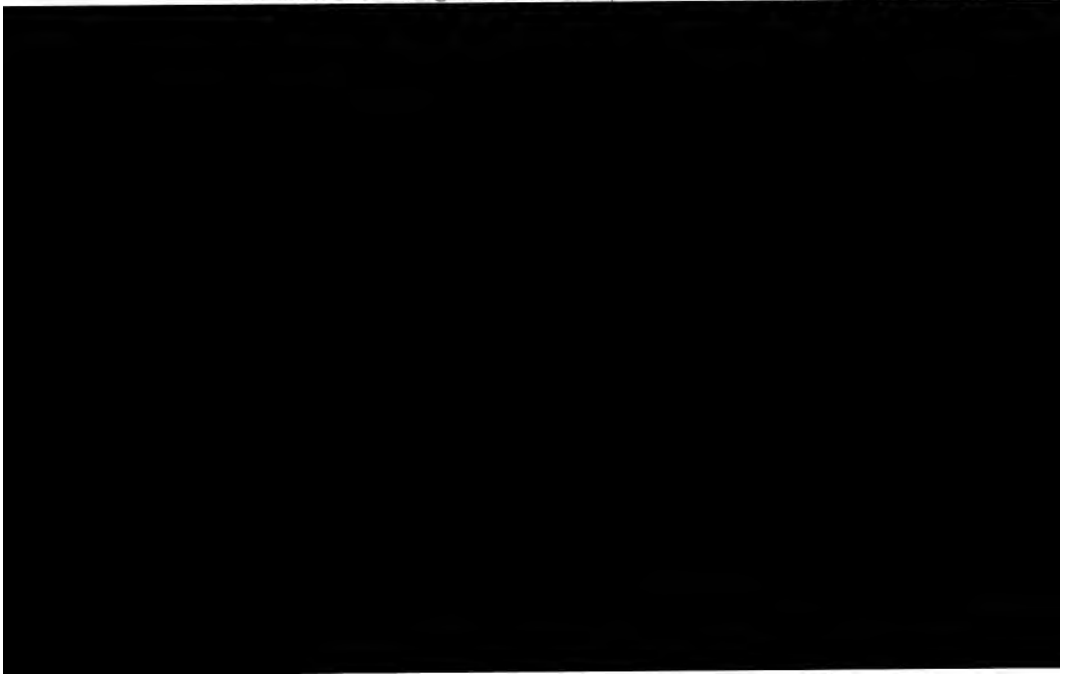
Three catalogues; four volumes of annual reports; blanks of administration; rules, etc.

MERRIAM, G. C., & CO., Springfield, Mass. (161.)

Dictionaries.

MINNESOTA SCHOOL FOR DEAF, Faribault, Minn., J. E. Noyes, president.

Circulars of information; history of the college; course of study; views of the buildings; drawings by students and copies of The Companion.



NATIONAL WOMAN'S CHRISTIAN TEMPERANCE UNION, Josephine R. Nichols, superintendent for fairs and expositions, 161 La Salle street, Chicago, Ill. (387.)

Scientific temperance books for schools; articles for training girls in kitchen-garden work; temperance libraries and publications.

NEW ENGLAND PUBLISHING COMPANY, Boston, Mass.

Current numbers of The Journal of Education and The American Teacher.

NEW HAVEN (CONN.) PUBLIC SCHOOLS, S. T. Dutton, superintendent.

Two volumes reports of board of education; one volume courses of study, blanks, etc.

NEW YORK HOUSE OF REFUGE, SCHOOL DEPARTMENT, Randall's Island, New York. (742.)

Writing, map drawing, accounts and problems, by the scholars.

NEW YORK MERCANTILE LIBRARY ASSOCIATION, New York City, W. J. Peoples, librarian.

Three annual reports; pamphlet on 50th anniversary celebration; catalogue with three supplements and two bulletins; specimen card catalogue and drawer; volume "New York City during American Revolution."

NORMAN WILLIAMS PUBLIC LIBRARY, Woodstock, Vt.

A volume of photographs and blanks.

NORTON PUBLIC LIBRARY, Norton, Mass., A. M. Round, librarian.

Catalogue of books and supplement; a report of the librarian and blanks used in the administration of the library.

OHIO COMMISSIONERS OF SCHOOLS, Columbus, Ohio.

Two volumes of the annual reports of the board for 1887 and 1888; one volume of school laws.

OHIO INSTITUTION FOR FEEBLE MINDED YOUTH, Columbus, Ohio.

Four frames of photographs of buildings, rooms, and children.

OMAHA PUBLIC LIBRARY, Omaha, Neb.

One catalogue and fifteen cards of statistics and forms.

OMAHA (NEB.) PUBLIC SCHOOLS, Henry M. James, superintendent.

Annual reports: rules of board of education; list of text-books; courses of study; blanks.

OREGON SCHOOL FOR DEAF MUTES, Salem, Oregon, Rev. P. S. Knight, superintendent.

Three volumes of biennial reports of the superintendent for 1884, 1886, and 1888; volume of The Sign and a photograph.

OSKALOOSA (IOWA) PUBLIC SCHOOLS, Orion C. Scott, superintendent.

Annual reports of superintendent of public schools, 1887 and 1888. Manuals; general blanks; geographical work on boards, six specimens.

PENN SCHOOL, St. Helena Island, South Carolina.

Portfolio blanks, views, scholars' work, three specimens of sewing, three English compositions, and eight sheets of drawings.

PENNSYLVANIA ORAL SCHOOL FOR THE DEAF, Scranton, Pa., Emma Garrett, principal.

The fourth annual report of the principal.

PENNSYLVANIA TRAINING SCHOOL, Elwyn, Pa.

Reports 1885 to 1886, inclusive.

PERKINS' INSTITUTION AND MASSACHUSETTS SCHOOL FOR THE BLIND, Boston, Mass., M. Anagnos, superintendent.

Thirty-five specimens of scholars' work; fifty-two specimens of kindergarten work; photographs.

PERRIN & SMITH, St. Louis, Mo.

Current numbers of the American Journal of Education.

PITTSBURGH (PA.) PUBLIC SCHOOLS, George J. Luckey, superintendent.

One frame, containing photographs of groups of students; thirteen volumes of scholars' work in arithmetic and language from Grades 1 to 7; two volumes of scholars' work from the normal school; one volume of scholars' work from the high school.

PORTLAND PUBLIC LIBRARY, Portland, Me., Stephen W. Watson, librarian.

By-laws; catalogue of books; blanks

Catalogue of exhibitors—Class 6.

PORTLAND PUBLIC LIBRARY—*Cont'd.*
of administration. Historical and Genealogical Record, Vol. IV.

POUGHKEEPSIE PUBLIC LIBRARY, Poughkeepsie, N. Y., John C. Stickley, librarian.
Report and manual of the board of education, catalogue of library, and mounted blanks of administration.

PRATT, D. C., 32 Church street, New York City. (806.)
School slates, crayons, and blackboard.

PROVIDENCE (R. I.) PUBLIC SCHOOLS, Horace S. Tarbel, superintendent.
Six reports of school committees; twelve manuals.

PUBLIC LIBRARY, Belleville, Ill., F. J. Stawfenbiel, librarian.
A portfolio containing a statistical exhibit of the library.

PUBLIC LIBRARY, Chelsea, Mass., Medora J. Simpson, librarian.
A catalogue of books and a supplement; a report of trustees, and the dedication of new building.

PUBLIC LIBRARY, Fitchburg, Mass., P. C. Rice, librarian.
Report of trustees; blanks of administration.

PUBLIC LIBRARY, St. Louis, Mo., Frederick M. Crunden, librarian.

PUBLIC LIBRARY, Toledo, Ohio, Mrs. T. D. Germain, librarian.
A catalogue of the books in the library, the rules and regulations, and the blanks used in the administration of the library.

PUBLIC LIBRARY, Warren, Mass.
Volume of photographs and blanks.

PUBLIC LIBRARY, West Brookfield, Mass., T. S. Knowlton, librarian.
A catalogue of books and supplement, dedication and committee reports, statistics, photographs, and blanks of administration of library.

PUBLIC SCHOOLS, Cincinnati, Ohio,
Reports and text-books.

RAND, MCNALLY & CO., 323 Broadway, New York, N. Y. (198.)
Maps, map-cases, and atlases.

RAUB, ALBERT N., Philadelphia, Pa.
Current numbers of The Educational New.

RIMMERSBURGH (PA.) PUBLIC SCHOOL.
Six volumes of pupils' work in drawing and language.

ROCHESTER (N. Y.) PUBLIC SCHOOLS, S. A. Ellis, superintendent.
Six volumes of annual reports of the superintendent of public schools 1882 to '88; five volumes of the proceedings of the board of education;

SCHOOL FOR YOUNG LADIES—*Continued.*
dents; scholars' work; maps, charts, drawings, essays, and writing books; circulars of information.

SILVER, BURDETTE & Co., Boston, Mass. (772.)
Six volumes of music readers and three charts; four volumes Child Life; nine volumes History of Political Economy, etc.; litho-photographs of Messrs. Tuffts and Holt, authors of their music system.

SILVER STREET KINDERGARTEN, San Francisco, Cal., Mrs. Kate D. Wiggin, principal.
List of members of the California Froebel Society; annual statements; students' work in drawing and writing.

SOCKANOSSET SCHOOL FOR BOYS, Howard, R. I., Franklin H. Nibecker, superintendent.
Files of Howard Times and job printing printed by boys; clothes and brushes made by boys; photographs of boys and buildings; writing books and programme of course of study.

STATE DEPARTMENT OF EDUCATION, Harrisburgh, Pa., E. E. Higbee, State superintendent.
Two volumes of annual reports of the State superintendent of public instruction; two volumes of annual reports of the superintendent of soldiers' orphans; two volumes of school laws.

STATE DEPARTMENT OF PUBLIC INSTRUCTION, Austin, Tex., C. H. Cooper, superintendent.
Two volumes of reports of superintendent of public instruction for 1886 and 1888; two maps and seventeen charts on language, mathematics, and science, prepared under the direction of the State superintendent.

STATE NORMAL SCHOOL REPORTS.
Collective exhibit from Baltimore; Md.; De Funiak Springs, Fla.; Fayette, Ark.; Fredonia, N. Y.; Los Angeles, Cal.; Milwaukee, Wis.; Oshkosh, Wis.; Peru, Neb.; Platteville, Wis.; River Falls, Wis.; Sacramento, Cal.; San José, Cal.; Tuskegee, Ala.; White Water, Wis., and Worcester, Mass.

STATE NORMAL SCHOOL REPORTS—*Con'd.*

STATE PUBLIC SCHOOL, Coldwater, Mich., W. J. Lowery, superintendent.
Circulars and scholars' work.

STATE SCHOOL REPORTS.
A collective exhibit of annual and biennial school reports from Alabama, Arkansas, California, Colorado, Connecticut, Dakota, Delaware, Florida, Illinois, Iowa, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Mississippi, Missouri, Nebraska, Nevada, New Hampshire, New York, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, Vermont, West Virginia, Wisconsin, and Washington.

SUPERINTENDENT OF EDUCATION OF MARYLAND, M. A. Newell, Baltimore, Md.
Articles of clothing made by normal-school students; scholars' work in drawing and botany; annual reports of the State superintendent for the years 1867, 1872, 1874, 1877, 1880, 1881, 1883, 1885, 1886, and 1887.

SUPERINTENDENT OF PUBLIC INSTRUCTION OF COLORADO, Leonidas S. Cornell, Denver, Colo.
Four biennial reports, 1882, 1884, 1886, 1888; education in Colorado 1861 to 1885.

THE BROOKLYN LIBRARY, Brooklyn, N. Y.
Four annual reports; manual of the trustees; catalogues and bulletins; prospectus of classified catalogue; blanks used in the administration of the library.

THE WILLIAMS PUBLISHING COMPANY, Cleveland, Ohio.
Michael's System of Penmanship; Michael's Compendium of Penmanship.

UNION SCHOOL DISTRICT, Concord, N. H., L. J. Rundlett, superintendent.
A framed chart showing the hours devoted to each study and scholars' work; one volume of specimens of penmanship and one volume of specimens of drawing.

Catalogue of exhibitors—Class 7.

UNTEREINER, Prof. CHARLES, Westchester County, N. Y.
Collection of reports of school superintendents, school laws, and circulars of schools.

VAILE, E. O., Chicago, Ill.
Current numbers of Intelligence.

VANCOUVER, Wash., J. C. Lawrence, superintendent.
Scholars' work; composition; examination papers; maps and writing books.

WALTHAM PUBLIC LIBRARY, Waltham, Mass., Sumner Johnston, librarian.
Catalogues; photographs; rules and administration blanks.

WATERTOWN LIBRARY ASSOCIATION, Watertown, Conn., Miss N. E. Bronson, librarian.
Report of librarian; copy of act of incorporation; catalogue, and blanks of administration of library.

WOBURN PUBLIC LIBRARY, Woburn, Mass., W. R. Cutter, librarian.
Photographs of the building, etc; the fourth annual report of the board of trustees.

WOBURN (MASS.) PUBLIC SCHOOLS.
Ten drawing books; five sheets map drawings; nine examination papers; three blank books; twenty-five blanks; one order book, and school reports from 1870 to 1888.

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BOARD OF EDUCATION OF WISCONSIN—*Continued.*
regents of normal schools; report of the board of regents for the University of Wisconsin; two catalogues of public school libraries; annual catalogues of the University of Wisconsin; annual catalogues of the State normal schools at River Falls, Milwaukee, Platteville, Oshkosh, and Whitewater, Wisconsin; report of the State superintendent for 1887 and 1888; blanks of administration.

BOSTON (MASS.) PUBLIC SCHOOLS, Calvin P. Seaver, superintendent.
Text-books; reference books; drawings; casts; furniture; and students' work from the public schools.

BUFFALO (N. Y.) PUBLIC SCHOOLS. (*See* Class 6.)

BUREAU OF EDUCATION, Washington, D. C.
Reports.

CATALOGUES OF SECONDARY SCHOOLS.
A collective exhibit from Adelphi Academy, Brooklyn, N. Y.; Alabama Conference Female College, Tuskegee, Ala.; Allen Academy, Chicago, Ill.; Alexander Institute, White Plains, N. Y.; Art Academy of Cincinnati, Ohio; Avalon College, Avalon, Mo.; Berkeley School, New

CATALOGUES OF SECONDARY SCHOOLS—*Continued.*

lege, Memphis, Tenn.; Cincinnati Wesleyan College, Cincinnati, Ohio; Classical School for Girls, Indianapolis, Ind.; Claverack College, Claverack, N. Y.; Cleveland College for Women, Cleveland, Ohio; Coe's Northwood Academy, Northwood Centre, N. H.; College and Seminary for Our Lady of Angels, Suspension Bridge, N. Y.; Collegiate and Polytechnic Institute, Brooklyn, N. Y.; Columbia Athenæum, Columbia, Tenn.; Columbia Female Institute, Columbia, S. C.; Columbia Art School, Columbus, Ohio; Davenport College, Lenoir, N. C.; Dr. Hasbrook's School, Sing Sing, N. Y.; Dr. Warring's School, Poughkeepsie, N. Y.; Drew Ladies' Seminary, Carmel, N. Y.; Dummer Academy, South Byfield, Mass.; East Florida Seminary, Gainesville, Fla.; East Greenwich Academy, East Greenwich, R. I.; Educational Institute, St. Louis, Mo.; Edwards' Academy, White Pine, Tenn.; Emerson Institute, Washington, D. C.; Freehold Institute, Freehold, N. J.; Friends' School, Providence, R. I.; Gannett Institute for Young Ladies, Boston, Mass.; Glendale Female College, Glendale, Ohio; Goddard Seminary, Barre, Vt.; Graylock Institute, South Williamstown, Mass.; Greensborough Female College, Greensborough, N. C.; Hannah Moore Academy, Baltimore, Md.; Harkville College, Harkville, Ind.; Hasbrook's Institute, Jersey City, N. J.; Hillsdale Seminary, Bridgeport, Conn.; Howard Female College, Gallatin, Tenn.; Huntsville Female College, Huntsville, Ala.; Indianapolis Institute for Young Ladies, Indianapolis, Ind.; Institute for Training Colored Ministers, Tuscaloosa, Ala.; Jacksonville Female Academy, Jacksonville, Fla.; Kemper Hall, Davenport, Iowa; Lake Erie Seminary, Painesville, Ohio; Linsley Institute, Wheeling, W. Va.; Logan Female College, Russellville, Ky.; Lucy Cobb Institute, Athens, Ga.; Marianna Institute, Marianna, Ark.; Marion Female College, Marion, Va.; Maryland Institute, Baltimore, Md.; Memphis Conference Female Institute, Jackson, Tenn.; Michigan Female Seminary, Kalamazoo, Mich.; Monson Academy, Monson, Mass.; Montgomery Institute, Montgomery, Ala.; Mount Holyoke College and Seminary, South Hadley, Mass.; Mrs. Anderson's School, Allegheny City, Pa.; Mrs. Sylvanus Reed's School, New York City; New Windsor College, New Windsor, Md.; Nichols Latin School, Lewiston, Me.; Norfolk Academy, Norfolk, Va.; Northfield Seminary, Northfield, Mass.; Ogontz School for Young Ladies, Ogontz, Pa.; Parkersburgh Seminary, W. Va.; Peddie Institute, Hightstown, N. J.; Peekskill Academy, Peekskill, N. Y.; Pennel Institute, Gray, Me.; Pennington Seminary, Pennington, N. J.; Pennsylvania Military Academy, Chester, Pa.; Philadelphia School of Design, Philadelphia, Pa.; Pittsburgh School of Design, Pittsburgh, Pa.; Pittsburgh Female College, Pittsburgh, Pa.; Richmond Female Institute, Richmond, Va.; Riverview Academy, Poughkeepsie, N. Y.; Rockford Seminary, Rockford, Ill.; St. Agnes School, Albany, N. Y.; St. John's Academy, Indianapolis, Ind.; St. Katherine's Hall, Davenport, Iowa; St. Louis Seminary, St. Louis, Mo.; St. Mark's School, Southborough, Mass.; St. Mary's Hall, Burlington, N. J.; St. Stanislaus Commercial College, Bay St. Louis, Miss.; Schaeffer, Prof. C. C., Philadelphia, Pa.; Scotia Seminary, Concord, N. H.; Selwyn Hall, Reading, Pa.; Seminary West of the Suwannee River, Tallahassee, Fla.; Seymour Smith Institute, Pine Plains, N. Y.; Seven Islands School, Buckingham County, Va.; Shorter College, Rome, Ga.; Sinclair's Preparatory School, Newburgh, N. Y.; Southern Female College, Peters-

Catalogue of exhibitors—Class 7.

CATALOGUES OF SECONDARY SCHOOLS—*Continued.*

burgh, Va.; Stamford Seminary, Stamford, N. Y.; Temple Grove Seminary, Saratoga, N. Y.; Thayer Academy, Braintree, Mass.; The Hill School, Pottstown, Pa.; the Packer Collegiate Institute, Brooklyn, N. Y.; Tuscaloosa Female College, Tuscaloosa, Ala.; Union Female College, Oxford, Miss.; Union School, Cooperstown, N. Y.; University of Cincinnati, Academic Department, Cincinnati, O.; Van Norman Institute, New York City; Virginia Military Institute, Lexington, Va.; Warsaw Union School, Warsaw, N. Y.; Wesleyan Academy, Wilbraham, Mass.; Wesleyan Female College, Macon. Ga.; Wentworth Academy, Lexington, Mo.; Westchester County Institute, Peekskill, N. Y.; Westminster Seminary, Fort Wayne, Ind.; Westtown School, Westtown, Pa.; Wheaton Female College, Norton, Mass.; Williamston Female College, Williamston, S. C.; Wolf Hall, Denver, Colo.

CHAUTAUQUA ASSOCIATION, Chautauqua, N. Y. (*See* Class 6.)

COLDWATER (MICH.) PUBLIC SCHOOLS. (*See* Class 6.)

DEPARTMENT OF PUBLIC INSTRUCTION OF

GODDARD SEMINARY, Barnet, Vt.

Portfolio containing chart of studies; forms; catalogues; account books; writing books; sketches, and photographs.

HARWOOD MANUFACTURING COMPANY, Boston, Mass. (*See* Class 6.)

HEATH, D. C. & Co., 5 Somerset st., Boston, Mass. (270.)

School and college text-books; small maps and charts; astronomical lantern; number tablet, etc.

HOWARD FEMALE COLLEGE, Gallatin, Tenn., A. M. Barney, president.

One portfolio of views; catalogue; blanks; students' work, etc.

INSTITUTE FOR TRAINING COLORED MINISTERS, Tuscaloosa, Ala.

Course of study and photograph of students.

LAKE ERIE SEMINARY, Painsville, Ohio, Miss Mary Evans, president.

Two volumes of choral music; one volume of photographs; catalogues; topic papers and forms; fifty-seven plates of drawings.

MICHIGAN FEMALE SEMINARY, Kalamazoo, Mich., Antoinette Bryant, principal.

A catalogue; pamphlets and students' drawings; copies of the Michigan Seminary notes.

ST. STANISLAUS COMMERCIAL COLLEGE—*Continued.*

Students' work; portfolios; specimens of book-keeping and penmanship; plan of college; map of Bay St. Louis and course of study; specimens of drawing; photographs of students and buildings.

SCHÆFFER, Prof. C. C., Philadelphia, Pa. (818).

Charts for instructing in languages and literature.

STAMFORD SEMINARY, Stamford, N. Y., F. M. Smith, principal.

A manuscript for a new text-book on geometry by F. M. Smith; photographs of classes and catalogues.

VAN NORMAN INSTITUTE, New York City, Madame Van Norman, principal.

One portfolio containing catalogues, photographs, statistics, and blanks; complete French class book by Rev. D. C. Van Norman; three volumes of boiler, pump, and steam-engine catechism by R. Grimshaw, Ph. D.; two volumes of practical training, by R. Grimshaw, Ph. D.

WARD, Dr. R. H., Troy, N. Y.

Botanical class book.

WESTTOWN SCHOOL, Westtown, Pa.

History published in 1888; lithographs, and a programme of studies.

CLASS 8.—ORGANIZATION—METHODS AND APPLIANCES FOR HIGHER INSTRUCTION.

ALBANY MEDICAL COLLEGE, Albany, N. Y.

Twenty-four pamphlets; catalogues, lectures, and alumni proceedings.

AMERICAN ANTIQUARIAN SOCIETY, Worcester, Mass.

Catalogue for 1836; index from 1812 to 1880, and four volumes of New Series papers.

AMERICAN HISTORICAL ASSOCIATION, New York City.

Volume 2 of the papers of the association.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, New York City.

Bound volumes and current numbers of the transactions of the Institute.

AMERICAN SCHOOL AT ATHENS, Greece.

Reports.

AMERICAN MUSEUM OF NATURAL HISTORY, New York City.

One volume of the Bulletin of the American Museum of Natural History, and one volume of annual reports.

AMERICAN NUMISMATIC AND ARCHÆOLOGICAL SOCIETY, New York City.

Constitution and by-laws; four volumes of proceedings; catalogue of library.

AMHERST COLLEGE, Amherst, Mass. Rev. Julius H. Seeley, D. D., LL. D., president.

Photographs; catalogues 1884 to 1889, inclusive; 2 volumes on physical culture; Tyler's history of the first half century of Amherst; Hitchcock's Reminiscences; Cutting's Student's Life; the president's inaugural and valedictory addresses; commemorative addresses; historical addresses and papers; biographical record of the alumni from 1821 to 1871; exercises of semi-centennial; triennial catalogue and examinations for admission.

BEREA COLLEGE, Berea, Ky., Rev. E. H. Fairchild, president.

History of Berea College. Catalogues, 1887-'89.

BOSTON UNIVERSITY, Boston, Mass., W. F. Warren, LL. D., president.

Annual report of the president; catalogues.

BROWN UNIVERSITY, Providence, R. I., Rev. E. G. Robinson, D. D., LL. D., president.

Report of the president; catalogue and list of students and alumni; text-books and publications by Profs. J. J. Jameson and A. S. Packard, of the faculty.

BUREAU OF ETHNOLOGY, Washington, D. C.

Reports.

BUREAU OF EDUCATION, Washington, D. C. (See Class 7.)

BUFFALO HISTORICAL SOCIETY, Buffalo, N. Y.

Volumes I and II of the publications of the society, reports, and addresses.

Catalogue of exhibitors—Class 8.

CARLETON COLLEGE, Northfield, Minn., Rev. James W. Strong, D. D., president.

A history of the college, catalogues, circulars, views of buildings, statement of course of study, and a map of Northfield. Copies of the Carletonian.

CHICAGO HISTORICAL SOCIETY, Chicago, Ill. The constitution and by-laws and a list of members.

CHICAGO HOMEOPATHIC MEDICAL COLLEGE, Chicago, Ill.

Three volumes of text-books.

CHICAGO LAW INSTITUTE LIBRARY, Chicago, Ill., Julius Rosenthal, librarian.

The catalogue of books and a supplement, and the rules and reports.

COLLEGE AND UNIVERSITY CATALOGUES.

Collective exhibit from Adelbert College, Cleveland, Ohio; Allegheny College, Meadville, Pa.; Albion College, Albion, Mich.; Amherst College, Amherst, Mass.; Amity College, College Springs, Iowa; Antioch College, Yellow Springs, Ohio; Atlanta University, Atlanta, Ga.; Baker University, Baldwin, Kans.; Baldwin University, Berea, Ohio; Bates College, Lewiston, Me.; Battle Creek College, Battle Creek, Mich.; Baylor College, Belton, Tex.;

COLLEGE AND UNIVERSITY CATALOGUES—*Continued.*

New Jersey, Princeton, N.J.; College of the City of New York, New York City; Columbian University, Washington, D. C.; Cornell College, Mt. Vernon, Iowa; Cornell University, Ithaca, N. Y.; Creighton College, Omaha, Neb.; Cumberland University, Lebanon, Tenn.; Curry University, Pittston, Pa.; Dartmouth College, Hanover, N. H.; Davidson College, Davidson College, N. C.; Delaware College, Newark, N. J.; Denison University, Denison, Texas; De Pauw University, Greencastle, Ind.; Doane College, Crete, Neb.; Drury College, Springfield, Mo.; Earlham College, Richmond, Ind.; Eden College, St. Louis, Mo.; Emory College, Oxford, Ga.; Emory and Henry College, Emory, Va.; Erskine College, Due West, S. C.; Eureka College, Eureka, Ill.; Ewing College Ewing, Ill.; Franklin College, Franklin, Ind.; Franklin College, New Athens, Ohio; Georgetown College, Georgetown, Ky.; Georgetown University, Washington, D. C.; Geneva College, Beaver Falls, Pa.; German-English College, Galena, Ill.; Grand Traverse College, Benzonia, Mich.;

COLLEGE AND UNIVERSITY CATALOGUES—*Continued.*

Ky.; Knox College, Galesburg, Ill.; Lafayette College, Easton, Pa.; Lake Forest University, Lake Forest, Ill.; Lane University, Lecompton, Kan.; La Salle College, Philadelphia, Pa.; Lebanon Valley College, Annville, Pa.; Lehigh University, South Bethlehem, Pa.; Lombard University, Galesburgh, Ill.; Luther College, Decorah, Iowa; Madison University, Hamilton, N. Y.; Manhattan College, New York City; Marietta College, Marietta, Ohio; Middlebury College, Middlebury, Vt.: Mississippi College, Clinton, Miss.; Mt. Holyoke Seminary, South Hadley, Mass.; Mt. St. Mary's College, Emmitsburg, Md.; Muhlenburg College, Allentown, Pa.; Muskingum College, New Concord, Ohio; Nebraska Central College, Central City, Neb.; Nevada State University, Reno, Nev.; New Orleans University, New Orleans, La.; New Windsor College, New Windsor, Md.; Niagara University, Buffalo Law School, Buffalo, N. Y.; Northwestern College, Napierville, Ill.; Northwestern University, Evanstown, Ill.: Oberlin College, Hiram, Ohio; Ogden College, Bowling Green, Ky.; Ohio State University, Columbus, Ohio; Ohio University, Athens, Ohio; Ohio Wesleyan University, Delaware, Ohio; Olivet College, Olivet, Mich.: Oskaloosa College, Oskaloosa, Iowa; Ottawa University, Ottawa, Kan.: Otterbein University, Westerville, Ohio; Pacific Methodist College, Santa Rosa, Cal.; Parsons College, Fairfield, Iowa; Pennsylvania College, Gettysburgh, Pa.; Philander Smith College, Little Rock, Ark.; Purdue University, La Fayette, Ind.; Racine College, Racine, Wis.; Roanoke College, Salem, Va.; Roger Williams University, Nashville, Tenn.; Rollins College, Winter Park, Fla.; Rose Polytechnic Institute, Terre Haute, Ind.; Rust University, Holly Springs, Miss.; Rutgers College, New Brunswick, N. J.; Santa Clara College, Santa

COLLEGE AND UNIVERSITY CATALOGUES—*Continued.*

Clara, Cal.; St. Charles College, Ellicott, Md.; St. Francis Solanus College, Chicago, Ill.; St. Ignatius College, San Francisco, Cal.; St. John's College, Annapolis, Md.; St. Joseph's Diocesan College, Tentopolis, Ill.; St. Lawrence University, Canton, N. J.; St. Mary's College, Marion County, Ky.; St. Meinrad's College and Ecclesiastical Seminary, St. Meinrad, Ind.; St. Stephen's College, Annandale, N. Y.; St. Viateur's College, Westmoreland County, Pa.; San Joaquin Valley College, Woodbridge, Cal.; Scio College, Scio, Ohio; Searcy College, Searcy, Ark.; Shaw University, Reaghi, N. C.; Shurtleff College, Upper Alton, Ill.; Simpson College, Indianola, Iowa; Society for the Collegiate Instruction of Women, Harvard University, Cambridge, Mass.; South Kentucky College, Hopkinsville, Ky.; Southwestern University, Georgetown, Tex.; Spring Hill College, near Mobile, Ala.; Straight University, New Orleans, La.; Swarthmore College, Swarthmore, Pa.; Syracuse University, Syracuse, N. Y.; Tabor College, Tabor, Iowa; Thiel College, Greenville, Pa.; Trinity College, Randolph, N. C.; Tufts College, College Hill, Mass.; Tulane University of Louisiana, New Orleans, La.; Union Christian College, Merom, Ind.; Union University, Albany and Schenectady, N. Y.; University of California, Berkeley, Cal.; University of Cincinnati, Cincinnati, Ohio; University of the City of New York, New York City; University of Dakota, Vermillion, Dak.; University of Des Moines, Des Moines, Iowa; University of Georgia, Athens, Ga.; University of Illinois, Urbana, Ill.; University of Kansas, Lawrence, Kan.; University of Michigan, Ann Arbor, Mich.; University of Missouri, Columbia, Mo.; University of North Dakota, Grand Forks, N. Dak.; University of Notre Dame, Notre Dame, Ind.; University of Pennsylvania, Philadelphia,

Catalogue of exhibitors—Class 8.

COLLEGE AND UNIVERSITY CATALOGUES—*Continued.*

Pa.; University of Rochester, Rochester, N. Y.; University of the South, Sewanee, Tenn.; University of Texas, Austin, Tex.; University of Vermont and State Agricultural College, Burlington, Vt.; University of Virginia, University of Virginia, Va.; University of West Virginia, Morgantown, W. Va.; Western Reserve University, Cleveland, Ohio; University of Wisconsin, Madison, Wis.; University of Wooster, Wooster, Ohio; Upper Iowa University, Fayette, Iowa; Ursinus College, Collegeville, Pa.; Vassar College, Poughkeepsie, N. Y.; Villa Nova College, Delaware County, Pa.; Wabash College, Crawfordsville, Ind.; Washburn College, Topeka, Kan.; Washington and Lee University, Lexington, Va.; Washington University, St. Louis, Mo.; Wellesley College, Wellesley, Mass.; Wesleyan University, Middletown, Conn.; Western College, Toledo, Iowa; Wettenburg College, Springfield, Ohio; Wheaton College, Wheaton, Ill.; Wilberforce University, Xenia, Greene County, Ohio; Wm. Jewell College, Liberty, Mo.; Wofford College, Spartanburg,

CORNELL UNIVERSITY, Ithaca, N. Y., C. R. Adams, LL. D., president.

Annual registers, 1887–'89; photographs of university buildings and grounds.

DARTMOUTH COLLEGE, Hanover, N. H., Rev. Samuel C. Bartlett, D. D., LL. D., president.

Bound volumes and current numbers of the college periodicals, Dartmouth Lyrics, Ægis, Dartmouth Literary Monthly, and The Dartmouth; illustrated book called Dartmouth and Vicinity; photographs of buildings, glee clubs, athletic clubs, and editorial boards; catalogue.

DAVENPORT ACADEMY OF NATURAL SCIENCE, Davenport, Iowa.

Five volumes of Proceedings.

DE PAUW UNIVERSITY, Greencastle, Ind., Bishop Thomas Bowman, D. D., LL. D., president.

Two volumes of catalogues, 1874–'88, inclusive; one portfolio of views, etc.

DOANE COLLEGE, Crete, Neb., Rev. David B. Perry, A. M., president.

Annual catalogue, 1887-'88; maps of Crete.

ECLECTIC MEDICAL COLLEGE, Cincinnati, Ohio, John M. Scudder, M. D., pres-

HEIDLEBERG COLLEGE, Tiffin, Ohio, Rev. George W. Willard, D. D., president.

A history of the college; six volumes, written by members of the faculty; a chart showing the hours devoted to each study by the classes; six photographs.

HISTORICAL SOCIETY OF DELAWARE, Wilmington, Delaware.

One volume papers of the Society; one volume description of Wilmington, Del.

HISTORICAL SOCIETY OF MONTANA, Helena, Mont.

Annual report of the librarian, and a catalogue of the law library; annual report for 1888 of the superintendent of public instruction; a copy each of the Heart of the Continent, Great Falls Tribune, West Shore, and a map of the St. Paul, Minneapolis & Manitoba Railroad.

HOMEOPATHIC MEDICAL COLLEGE, Chicago, Ill., J. R. Kippax, M. D., secretary.

Announcement for 1888-'89, and textbooks by Professors John S. Kipper and E. H. Pratt.

INDIANA STATE MEDICAL SOCIETY, Indianapolis, Ind.

Four volumes of Transactions.

JOHNS HOPKINS UNIVERSITY, Baltimore, Md.

Three sets of photographs of the normal sun spectrum; four photographs of the carbon spectrum; twelve negatives of the spectrum; four gratings by Rowland, and publications of the University.

KENTUCKY UNIVERSITY, Lexington, Ky., Charles Louis Loos, president.

A portfolio containing photographs, catalogues, and blanks of administration of the College of Liberal Arts.

LAFAYETTE COLLEGE, Easton, Pa., Rev. James H. Mason Knox, D.D., LL.D., president.

Current numbers of The Lafayette, and one volume of The Melange; students' publications, and six photographs; illustrated descriptive pamphlet; annual catalogue, 1887-'89; examination questions.

LEHIGH UNIVERSITY, South Bethlehem, Pa., Robert A. Lamburton, LL.D., president.

The Lehigh Burr, published by the students; twenty-five photographs of building, faculty, and students, and catalogues.

LICK OBSERVATORY, Mount Hamilton, California.

Thirty-two photographs of the observatory, telescope, and moon.

LUTHERAN THEOLOGICAL SEMINARY, Gettysburg, Pa.

Three frames of photographs, charts, etc.

MASSACHUSETTS COLLEGE OF PHARMACY, Boston, Mass., Charles C. Williams, Ph. D., M. D., secretary.

The course of study; a portfolio of views of the college and students; students' works—box of pharmaceutics prepared by them.

MASTER CAR BUILDERS' ASSOCIATION, New York City.

Eight volumes of annual reports; five volumes of reports of conventions.

MEDICAL COLLEGE OF VIRGINIA, Richmond, Va., J. S. D. Cullen, M. D., dean.

Annual catalogue, 1887-'88; list of graduates.

MEDICAL SCHOOL CATALOGUES.

Collective exhibit from Albany College of Pharmacy, Albany, N.Y.; Albany Medical College, Albany, N.Y.; Baltimore Medical College, Baltimore, Md.; Chicago College of Dental Surgery, Chicago, Ill.; Chicago Homeopathic Medical College, Chicago, Ill.; College of Pharmacy of the City of New York, New York; College of Physicians and Surgeons, Baltimore, Md.; Eclectic Medical College, Cincinnati, Ohio; Hahnemann Hospital College, San Francisco, Cal.; Hahnemann Medical College and Hospital, Philadelphia, Pa.; Harvard Medical College, Boston, Mass.; Leonard Medical College, Raleigh, N. C.; Massachusetts College of Pharmacy, Boston, Mass.; Medical College of Virginia, Richmond, Va.; New York College of Dentistry, New York City; New

Catalogue of exhibitors—Class 8.

MEDICAL SCHOOL CATALOGUES—*Cont'd.*
York College of Veterinary Surgery, New York City; New York Homeopathic Medical School, New York City: New York Polyclinic, New York City: New York Postgraduate Medical School, New York City; Philadelphia College of Pharmacy, Philadelphia, Pa.; Philadelphia Polyclinic, Philadelphia, Pa.; St. Louis Medical School, St. Louis, Mo.; School of Pharmacy, Purdue University, Lafayette, Ind.

MEDICAL SOCIETY OF KINGS COUNTY, Brooklyn, N. Y.
Eight volumes of the Proceedings of the society and two volumes of the medical journal published by the society.

MOUNT HOLYOKE COLLEGE AND SEMINARY, South Hadley, Mass., Miss E. Blanchard, president.
Pamphlet on semi-centennial celebration and history of Mount Holyoke Seminary: catalogues 1887 to '89; photographs, etc.

NATIONAL LAW SCHOOL, WASHINGTON, D. C.
Reports.

NEW HAVEN HISTORICAL SOCIETY, New Haven, Conn.
Four volumes of papers of the society.

NORTHWESTERN UNIVERSITY—*Cont'd.*
used in making reports, etc.; map of town showing location of buildings; circulars; syllabus.

PARKS, C. WELMANN, Rensselaer Polytechnic Institute, Troy, N. Y. (299.)
A statistical chart of universities, colleges, science schools, and institutions for the superior instruction of woman; an exhibit of periodicals published by students; map of the United States, showing the location of public institutions and railroads.

PARKS, M. B., Troy, N. Y. (771.)
Books, pamphlets, etc. Publications of the King's Daughters.

PHILADELPHIA COLLEGE OF PHARMACY, Philadelphia, Pa.
A chart showing plans and views of buildings, number of instructors and students, courses of lectures; fifteen text books, and catalogues.

REGENTS OF THE UNIVERSITY OF THE STATE OF NEW YORK, Albany, N. Y.
Eighteen volumes of regents' reports, 1871 to 1888; sixteen volumes of convocation proceedings, 1872–1888; seventeen volumes State museum reports, 1867–1887; three volumes of library reports, 1878–1888; one volume historical and statistical

ST. JOSEPH DIOCESAN COLLEGE, Tentopolis, Ill., Rev. P. Michael Richardt, O. S. F., president.

Photographs of faculty and classes; blanks and catalogues.

ST. STEPHEN'S COLLEGE, Annandale, N. Y., Rev. R. B. Fairbairn, D. D., LL. D., president.

Seven photographs of buildings and students, address at twenty-fifth anniversary, and proceedings at the laying of the corner-stone; rules, regulations, reports and catalogues—four volumes; college sermons by R. B. Fairbairn: on Morality by R. B. Fairbairn; on Revelation by W. W. Olsen; on Personality by W. W. Olsen; current numbers of the Churchman.

SMITHSONIAN INSTITUTION, Washington, D. C.

Reports, etc.

SOCIETY FOR THE COLLEGIATE INSTRUCTION OF WOMEN, HARVARD UNIVERSITY, Cambridge, Mass.

Reports of treasurer and secretary, contributions, catalogues, and blanks of administration.

SWARTHMORE COLLEGE, Swarthmore, Pa., Edward H. Magill, LL. D., president.

Annual Catalogue, 1888'–89; current numbers of Swarthmore Phœnix, and information regarding athletics in the college.

THE SOUTHERN HISTORICAL SOCIETY, Richmond, Va.

Vol. XV of the papers of the society and circulars.

THEOLOGICAL SEMINARY CATALOGUES.

Collective exhibits from Chicago Theological Seminary, Chicago, Ill.; Episcopal Theological School, Cambridge, Mass.; Meadville Theological School, Meadville, Pa.; Richmond Theological Seminary, Richmond, Va.; Union Theological Seminary, New York City; Williamsport Dickinson Seminary, Williamsport, Pa.

TULANE UNIVERSITY OF LOUISIANA New Orleans, La., William Preston Johnson, LL.D., president.

Catalogues for 1887–'89; catalogue and list of alumni of medical department.

UNION FOR CHRISTIAN WORK, Brooklyn, N. Y.

Two annual reports; catalogue of books in Free Library; portfolio of views.

UNION UNIVERSITY, Albany and Schenectady, N. Y.

Commencement address and catalogues, Albany College of Pharmacy; catalogues and addresses, Albany Medical College; constitution and proceedings, Association of Alumni; catalogue of Union College 1888'–89.

UNITED STATES GEOLOGICAL SURVEY, Washington, D. C. (757).

Reports and charts. (*See also* Classes 12 and 16.)

UNITED STATES NAVAL ACADEMY, Annapolis, Md., Commander W. T. Simpson, Superintendent.

Text-books used in the academy and circulars of information.

UNITED STATES SIGNAL SERVICE, Washington, D. C. (722).

Publications and instruments; charts showing the results of systematic observation, and monographs of deductions from the same. (*See* Classes 15 and 16.)

UNITED STATES WAR DEPARTMENT, Washington, D. C.

Reports of expeditions to Point Barrow and Lady Franklin Bay.

UNIVERSITY OF ILLINOIS, Urbana, Ill., Selim H. Peabody, Ph. D., LL.D., president.

Eleven volumes of annual reports; one volume views, drawings, etc.; two catalogues.

UNIVERSITY OF VIRGINIA, University of Virginia, Va., Charles S. Venable, LL.D., chairman of the faculty.

Text-books, photographs, etc.

UPPER IOWA UNIVERSITY, Fayette, Iowa, Rev. J. W. Bissell, D. D., president.

Annual catalogues and prospectus, 1888'–89; blanks used in the administration; bound volumes of the Fayette Collegian.

URSINUS COLLEGE, Collegeville, Pa., George W. Bowman, president *pro tempore*.

Three numbers of the College Bulletin; proceedings and addresses at the semi-centennial 1886; invitations, and annual catalogue for 1888.

Catalogue of exhibitors—Class 8.

VASSAR COLLEGE, Poughkeepsie, N. Y., Rev. James M. Taylor, D. D., president.

Twenty-two photographs of buildings, and three volumes descriptive of Vassar; course of study and catalogues.

VIRGINIA HISTORICAL SOCIETY, Richmond, Va.

Five volumes of historical collections; two volumes of Spottiswood Letters; the proceedings of the society, and circulars.

WASHINGTON AND LEE UNIVERSITY, Lexington, Va., General G. W. C. Lee, president.

Three volumes of catalogues and addresses; two volumes of text-books and one volume of notes; course of study; two volumes of the Southern Collegian; portfolio of views.

WELLESLEY COLLEGE, Wellesley, Mass., Miss Helen Shaefer, president.

Examination papers for entrance, and for the French and German courses; students' work in French; students' book; class book of 1886; book of pictures of buildings, and four text-books.

YALE UNIVERSITY, New Haven, Conn., Rev. Timothy Dwight, D. D., LL. D., president.

CLASSES 6, 7, 8.—TECHNICAL AND INDUSTRIAL EDUCATION.

AGRICULTURAL COLLEGE CATALOGUES.

Collective exhibit from the Agricultural and Mechanical College of Texas, College Station, Tex.; Iowa State Agricultural and Mechanical College, Ames, Iowa; Kansas State Agricultural and Mechanical College, Manhattan, Kans.; State Agricultural and Mechanical College, Fort Collins, Col.; State Agricultural and Mechanical College, Lake City, Fla.; State Agricultural and Mechanical College, Auburn, Ala.; The Virginia Agricultural and Mechanical College, Lynchburgh, Va.

ALABAMA POLYTECHNIC INSTITUTE, Auburn, Ala., William Le Roy Broun, A. M., LL. D., president.

Catalogue and descriptive circular; scholars' work: forty-five plates of drawings in portfolio.

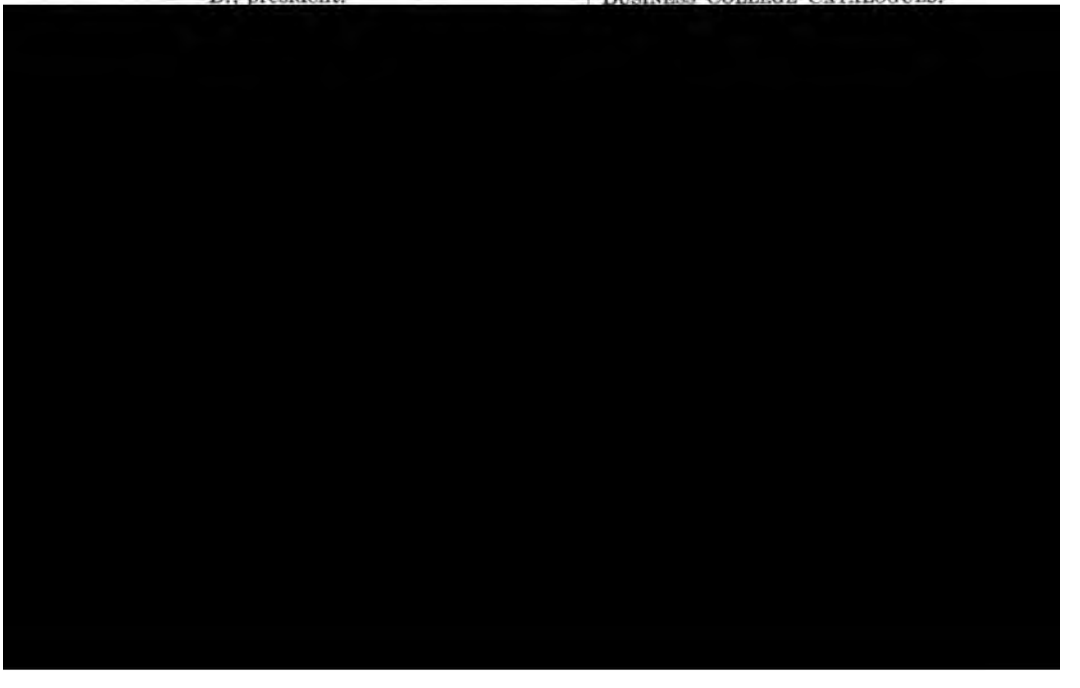
BELLEVUE TRAINING SCHOOL FOR NURSES, New York City, Eliza P. Perkins, superintendent.

Copies of the sixteenth annual report; photographs of buildings and classes.

BRYANT, STRATTON & SMITH BUSINESS COLLEGE, Meadville, Pa.

One volume of students' work.

BUSINESS COLLEGE CATALOGUES.



BUSINESS COLLEGE CATALOGUES—*Continued.*

Packard Business College, New York City; Reading Business College, Reading, Pa.; Rochester Business University, Rochester, N. Y.; Seattle Business College, Seattle, Wash.; St. Paul Business College, St. Paul, Minn.; St. Stanislaus Business College, Bay St. Louis, Miss.; Soulé Business College, New Orleans, La.; Spencerian Business College, Cleveland, Ohio; Spencerian Business College, Washington, D. C.; Business College, Newark, N. J.; Texas Business College, Paris, Tex.; Troy Business College, Troy, N. Y.; Zanesville Business College, Zansesville, Ohio.

COOPER UNION, New York City, George W. Plympton, A. M., C. E., director.

Copies of the ninth annual report of the board of trustees; three portfolios of drawings and twelve oil paintings, all scholars' work.

DEPARTMENT OF PUBLIC INSTRUCTION OF ILLINOIS, Springfield, Ill.

Reports of the State superintendent for the years 1867–1886; reports for the Industrial University, 1870–1886.

EASTMAN BUSINESS COLLEGE, Poughkeepsie, N. Y., C. C. Gaines, president.

One case containing photographs of grounds, buildings, and students; artistic pen-work by students; samples of money, cloth, grains, etc., used in the exercises of the school; two portfolios of photographs; one volume of drawings; one volume of catalogues; two volumes of pamphlets concerning Poughkeepsie; seven volumes of students' work, and thirty-four volumes text-books.

ENGINEERING SCHOOL CATALOGUES.

Collective exhibit from the Alabama Polytechnic Institute, Auburn, Ala.; Case School of Applied Science, Cleveland, Ohio; Cornell University, Ithaca, N. Y.; Dakota School of Mines, Rapid City, Dak.; Lafayette College, Easton, Pa.; Lehigh University, South Bethlehem, Pa.; Massachusetts Institute of Technology, Boston, Mass.; Polytechnic Institute, New Market, Va.; Rensselaer Polytechnic Institute, Troy, N. Y.; Ross Polytechnic Institute, Terre Haute, Ind.; School of Mines, Columbia College, New York City; Stevens Institute of Technology, Hoboken, N. J.; University of Illinois, Urbana, Ill.; University of Michigan, Ann Arbor, Mich.; University of Wisconsin, Madison, Wis.; Washington and Lee University, Lexington, Va.; Worcester Polytechnic Institute, Worcester, Mass.

ENGINEERING SCHOOL CATALOGUES—*Continued.*

FREE EVENING INDUSTRIAL DRAWING SCHOOL, Boston, Mass.

Students' work.

INDIAN INDUSTRIAL SCHOOL, Carlisle, Pa (*See* Class 6.)

Students' work.

KANSAS STATE AGRICULTURAL COLLEGE, Manhattan, Kans.

Photographs of buildings, plan of grounds; chart of studies, and students' work in botany, zoölogy, printing, drawing, and wood-turning.

KIMBALL, D., Chicago, Ill.

1. Text-books; Shorthand Writer; The Amanuensis and Key to the Amanuensis; 2. Circulars.

LEHIGH UNIVERSITY, South Bethlehem, Pa. (*See* Class 8.)

MANUAL TRAINING SCHOOL, St. Louis, Mo., C. M. Woodward, director.

The following students' work: One hundred and seven plates of drawings; three hundred and seventy pieces of work in wood; joining, pattern work, turning, and carving; two hundred pieces of forge work in iron; one hundred pieces of chipping and machine-finished iron work.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Boston, Mass., Francis A. Walker, LL. D., president.

Two volumes Views of Buildings and Rooms; one volume of Architectural Quarterly; three volumes of Technology Quarterly; one volume of Proceedings of the Society of Arts; one volume of Notes and Publications of Mechanical Department;

Catalogue of exhibitors—Classes 6, 7, 8.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY—*Continued.*

one volume Notes and Publications of Chemical, Mineralogical, Biological, and Mining Departments; one volume Notes of Physical Department; three volumes of work by students and laboratory views; nine volumes of notes and text-books; one volume of catalogues and president's reports; Technique for 1885 and 1886; volumes 7 and 8 of the Tech, and catalogues for 1888 and 1889.

PHILADELPHIA MANUAL TRAINING SCHOOL, Philadelphia, Pa. (498.)

Chart showing course of study; four volumes of maps by pupils illustrating the growth of the United States from 1790 to 1880; eleven portfolios of drawings by pupils, free-hand, mechanical, perspective, and charts; one hundred pieces of wood-work, joints, pattern work, turning, and carving; fifty pieces of iron forging; thirty pieces of chipping and machine work; thirteen lead castings; a Wheatstone bridge; methods of electric-light wiring; models of dynamo armatures; standard battery; apparatus for finding magnetic field in dynamo; a table top and door.

RENSSELAER POLYTECHNIC INSTITUTE, Troy, N. Y.—*Continued.*

erected by Dr. Lindsay; maps showing railroad lines upon which graduates are employed; six maps of surveys made by students; fifteen volumes of students' drawings; twenty-nine volumes of publications by graduates; thirty-nine photographs of bridges erected by graduates; thirty-two photographs of buildings and students, and forms.

ST. STANISLAUS COMMERCIAL COLLEGE, Bay St. Louis, Mo., Brother Osmond, president.

Students' work; portfolios; specimens of book-keeping and penmanship; plan of college; map of Bay St. Louis and course of study; specimens of drawing; photographs of students and buildings.

SMITH, W. H., Lexington, Ky.

Text-book on book-keeping; a volume containing specimen pen-work.

SOCKANOSSET SCHOOL FOR BOYS, Howard, R. I., Franklin H. Nibecker, superintendent.

Files of Howard Times and job printing printed by boys; clothes and brushes made by boys; photographs of boys and buildings; writing-books and programme of course of

WILEY, JOHN & SONS, Astor place, New York, N. Y. (363.)
Books.

WOOD, DEVOLSON, Hoboken, N. J.
Text-books on thermo-dynamics.

WORCESTER POLYTECHNIC INSTITUTE, Worcester, Mass., Homer F. Fuller, Ph. D., president.
Current numbers of the Worcester Polytechnic Institute; photographs of the editors of the Worcester Polytechnic Institute; catalogues for 1888–'89.

CLASS 9.—PRINTING AND BOOKS.

ADIRONDACK RAILROAD COMPANY, Saratoga, N. Y.
Copies of the "Birch Bark of the Adirondacks," specimen advertising publications.

AMERICAN PERIODICALS.
The following publications are represented at the Exposition by the current numbers: America, Chicago, Ill.; American Agriculturist, New York City; American Bookmaker, New York City; American Chemical Journal, Baltimore, Md.; American Journal of Education, St. Louis, Mo.; American Journal of Mathematics, Baltimore, Md.; American Journal of Railroad Appliances, Chicago, Ill.; American Machinist, New York City; American Stationer, New York City; American Teacher, Boston, Mass.; Amherst Student, Amherst, Mass.; Argus, Philadelphia, Pa.; Baptist Missionary Magazine, Boston, Mass.; Baldwin's Textile Designer, Brasher Falls, N. Y.; Black Diamond, Chicago, Ill.; Brewers' Journal, New York City; Carpentry and Building, New York City; Columbia Spectator, New York City; Columbus Despatch, Columbus, Ohio; Common School Education, Boston and New York City; Crockery and Glass Journal, New York City; D. U. Quarterly, New York City; Drug, Oil and Paint Reporter, Philadelphia, Pa.; Eclectic Medical Journal, Cincinnati, Ohio; Education, Boston, Mass.; Educational Courant, Louisville, Ky.; Educational Gazette, Rochester, N. Y.;

AMERICAN PERIODICALS—*Continued.*
Educational News, Philadelphia, Pa.; Electrical Engineer, New York City; Electrical Review, New York City; Engineering and Mining Journal, New York City; Farm Implement News, Chicago, Ill.; Florida School Journal, Lake City, Fla.; Illinois School Journal, Bloomington, Ill.; Indiana School Journal, Indianapolis, Ind.; Indicator, Hoboken, N. J.; Industrial World and Iron Worker, Chicago, Ill.; Intelligence, Chicago, Ill.; Johns Hopkins University Circulars, Baltimore, Md.; Journal of Education, Boston, Mass.; Laselle Leaves, Auburndale, Mass.; Magazine of Western History, New York City; Maine Historical and Genealogical Records, Portland, Me.; Minnehaha Teacher, Sioux Falls, Dak.; Musical Journal, Philadelphia, Pa.; National Laundry Journal, Chicago, Ill.; New York Observer, New York City; Ogontz Mosaic, Ogontz, Pa.; Pacific Illustrated Press, San Francisco, Cal.; Paper Trade Journal, New York City; Pen Pulpit, Troy, N. Y.; Photographic Bulletin, New York City; Political Science Quarterly, New York City; Popular Educator, Boston, Mass.; Power—Steam, New York City; St. Nicholas, New York City; School and Home, St. Louis, Mo.; Science, New York City; Southwestern Journal of Education, Nashville, Tenn.; Swiss Cross, New York City; Technology Quarterly, Boston, Mass.; Texas Siftings, New York City; The Academy, Syracuse, N. Y.; The Alabama Teachers' Journal, Cincinnati, Ohio; The American Engineer, Chicago, Ill.; The American Exporter, New York City; The American Garden, New York City; The American Journal of Medical Science, Philadelphia, Pa.; The American Mail and Export Journal, New York City; The American Rural Home, Rochester, N. Y.; The Angola Record, Angola, N. Y.; The American Stationer, New York City; The American Teacher, Boston, Mass.; The Art Interchange, New York

Catalogue of exhibitors—Class 9.

AMERICAN PERIODICALS—*Continued.*

City; The Artisan, Cincinnati, Ohio; The Baptist Missionary, Boston, Mass.; The Bee-Keepers' Advance, Mechanics' Falls, N. Y.; The Boston Globe, Boston, Mass.; The Brooklyn Medical Journal, Brooklyn, N. Y.; The Building Budget, Chicago, Ill.; The Burlington Hawkeye, Burlington, Iowa; The Butchers' Advocate, New York City; The California Cackler, San Francisco, Cal.; The Carltonian, Northfield, Minn.; The Century, New York City; The Chicago Tribune, Chicago, Ill.; The Chronicle, Ann Arbor, Mich.; The Clay Worker, Indianapolis, Ind.; The College Star, Warrenton, Mo.; The Columbia Spectator, New York City; The Commoner and Glass Worker, Pittsburg, Pa.; The Courant, Wellesley, Mass.; The Critic, New York City; The Daily Crimson, Cambridge, Mass.; The Dartmouth, Hanover, N. J.; The Decorator and Furnisher, New York City; The Educational Journal of Virginia, Richmond, Va.; The Electrical World, New York City; The Electro-Mechanic, Kansas City, Mo.; The Engineering and Building Record, New York City; The Farm and Home, Springfield,

AMERICAN PERIODICALS—*Continued.*

New York City; The Lumber Worker, Cincinnati, Ohio; The Massachusetts Ploughman, Boston, Mass.; The Medical News, Philadelphia, Pa.; The Mercantile and Financial Times, New York City; The Metal Worker, New York City; The Millstone, Indianapolis, Ind.; The Mississippi Valley Lumberman, Minneapolis, Minn.; The Monthly Pennsylvania School, Williamsport, Pa.; The Monumental News, Chicago, Ill.; The National Educator, Allentown, Pa.; The New York Lumber Trade Journal, New York City; The North Carolina Teacher, New York City; The Office, New York City; The Ohio Educational Monthly, Akron, Ohio; The Painters' Journal, Chicago, Ill.; The Pharmaceutical Record, New York City; The Philadelphia Carpet Trade, Philadelphia, Pa.; The Polytechnic, Troy, N. Y.; The Presbyterian, Philadelphia, Pa.; The Press, New York City; The Red Man, Carlisle, Pa.; The Sanitary News, Chicago, Ill.; The Sanitarium, New York City; The School Bulletin, Syracuse, N. Y.; The School Herald, Chicago, Ill.; The School Journal, New York City; The School Teacher, Winston, N. C.;

AMERICAN PERIODICALS—*Continued.*
tions of the American Institute of Electrical Engineers, New York City; Truth, New York City; United States Sewing Machine Times, New York City; Ursinus College Bulletin, Collegeville, Pa.; Watchman, Chicago, Ill.; Western School Journal, Topeka, Kans.; Williams Literary, Williamstown, Mass.; Wisconsin Journal of Education, Madison, Wis.

ANTHONY, E. & H. T., & Co., New York City.
Current numbers of the Photographic Bulletin.

APPLETON, D., & Co., 105 Bond street, New York, N. Y. (365.)
Books.

ARMSTRONG & KNAUER, 822 and 824 Broadway, New York, N. Y. (342.)
A volume entitled The Manufacturers of the United States for Domestic and Foreign Trade.

AYER, H. H., Lowell, Mass.
Almanac for 1889 in twenty-one languages.

BACON, G. A., Syracuse, N. Y.
Current numbers of the Academy.

BAIRD, HENRY, CAREY & CO., 810 Walnut street, Philadelphia, Pa. (345.)
Books.

BALDWIN, A. A., publisher, Brasher Falls, N. Y.
Current numbers of Baldwin's Textile Designer.

BARDEEN, C. W., & Co., Syracuse, N. Y.
(*See* Class 6.)

BARNARD PUBLISHING COMPANY, Hartford, Conn.
Twenty-eight volumes Barnard's Journal of Education, 1857–1880; eighteen volumes upon educational subjects, and twenty-five pamphlets.

BARNES, A. S. & Co., 111 and 113 William street, New York City. (349.)
Books.

BARRIE, GEORGE, 1313 Walnut street, Philadelphia, Pa.
Books.

BEATTY, CLAUDIUS F., 107 Prince street, New York, N. Y.
Samples of engraving and tip printing shown in the exhibit of R. Dunlap & Co., manufacturers of hats.

BELDEN, A. L., publisher, New York City.
Current numbers of The Fur Trade Review and The Hat Review.

BELL PUBLISHING COMPANY, 834 Broadway, New York City. (775.)
Copies of The United States Sewing Machine Times and other periodicals.

BOSTON AND MAINE RAILROAD COMPANY, Boston, Mass.
Advertising publications called Summer Excursions, Down East Latch Strings, and Sea Shore, Lake, and Mountains.

BOWKER, R. R., Franklin Square, New York, N. Y.
Books and periodicals.

BRENTANO, A., 5 Union Square, New York, N. Y. (543.)
Books and periodicals.

BRICKELL, WILLIAM D., Columbus, Ohio.
Current numbers of the Columbus Despatch.

BROEN, JOSEPHINE DE, 3 rue Clavel, Paris, France. (408.)
Books, brochures, papers, and photographs connected with the temperance society of America (W. C. T. U.)

BROWN, GEORGE P., Bloomington, Ill.
Current numbers of the Illinois School Journal.

BUREAU OF ENGRAVING AND PRINTING, Washington, D. C.
Specimens of engraving and printing of United States money, bonds, etc.

BURGESS, MISS M., Carlisle, Pa.
Current numbers of The Indian Helper and The Red Man.

BURR, W. H., C. E., Phœnixville, Pa.
Text-books on applied mechanics.

BUTCHERS' PUBLISHING COMPANY (The), New York City.
Current numbers of The Butcher's Advocate.

BUTTERWORTH, BENJAMIN, Washington, D. C.
Growth of the industrial arts.

CAROTHERS, R. H., Louisville, Ky.
Current numbers of the Educational Courant.

CENTURY COMPANY (The), New York City. (389.)
Books and current numbers of the Century and St. Nicholas.

Catalogue of exhibitors—Class 9.

CHARLES SCRIBNER'S SONS, New York City.
A copy of the Statistical Atlas.

COHEN & Co., Publishers, Cincinnati, Ohio.
Current numbers of The Artisan, The Furniture Worker, and The Lumber Worker.

COLUMBIA COLLEGE, New York City.
Current numbers of the Columbia Spectator.

CONTANSEAU, L., 171 Broadway, New York City. (343.)
Monthly Bulletin.

DODD, MEAD & Co., 753 Broadway, New York City. (364.)
Publications.

EDUCATIONAL PUBLISHING COMPANY, Boston, Mass.
Current numbers of The Popular Educator.

ESTES & LAURIAT, 301 Washington street, Boston, Mass. (360.)
Publications.

FINDLEY, SAMUEL, Akron, Ohio. (639.)
Current numbers of The Ohio Educational Monthly and National Teacher.

FISHEL, ADLER & SCHWARTZ, 94 Fulton street, New York, N. Y. (522.)
Etchings and engravings.

GINN & Co., New York, Boston, Chicago. (803.)
Educational text-books.

HARRIS, E. P., New York City.
The Street Railway Journal.

HARRIS. J. B., Wilton, Iowa.
Book-keeping for the Masses.

HARVARD DAILY CRIMSON, Cambridge, Mass.
One bound volume, No. XIV, and current numbers of the paper and a photograph of the editorial staff.

HARRELL, EUGENE G., Raleigh, N. C.
Current numbers of The North Carolina Teacher.

HEATH, D. C., & Co. (*See* Class 7.)

HORNE, A. R., Allentown, Pa.
Current numbers of The National Educator.

HOUGHTON, MIFFLIN & Co., Cambridge, Mass. (359.)
The Riverside Press books and publications.

HOUSE PAINTING AND DECORATING PUBLISHING COMPANY, Philadelphia, Pa.
Three bound volumes of House Painting and Decorating.

HOWARD LOCKWOOD & Co., New York City.
Current numbers of The Paper Trade Journal, American Stationer, American Bookmaker, and The American

INSURANCE DEPARTMENT OF PENNSYLVANIA.
Two volumes of the Fifteenth Annual Report of Life, Fire, and Marine Insurance.

INSURANCE DEPARTMENT OF WISCONSIN, Madison, Wis.
Two volumes of reports of the commissioners.

INTERIOR DEPARTMENT, Washington, D. C.
Twenty-three volumes of the Census of 1880, and a Portfolio of Statistical Charts. Two volumes of the Official Register of the United States for 1887. Three volumes of annual reports, Bureau of Labor. Three volumes of the Land Laws of the United States. One volume of the Public Domain. The Fourth Annual Report of the United States Civil Service Commission. Two volumes of report of the Secretary of the Interior, 1887.

IRELAN, WILLIAM, Jr., State mineralogist of California, Sacramento, Cal.
Three annual reports, 1886–'88, inclusive.

IVISON, BLAKEMAN & CO., New York City. (362.)
Books.

JOHNS HOPKINS UNIVERSITY PUBLICATION AGENCY, Howard street, Baltimore, Md. (351.)
Books, photographs, periodicals, etc.

JOHNSON, CHARLES J., & CO., 105 Madison street, Chicago, Ill. (406.)
Samples of printing.

JOHNSON, B. F., & CO., 1009 Main street, Richmond, Va. (667.)
Books, Bibles, albums, etc.

JOHNSTON & CO., W. J., New York City. (716.)
Current numbers of the Electrical World.

KNOX, THOMAS W., New York City. (703.)
Books: Boy Traveller Series, etc.

KNOX, J. AMORY, New York City.
Current numbers of the Texas Siftings.

LINDSAY, ROBERT M., 1028 Walnut street, Philadelphia, Pa. (356.)
Books and Etchings.

LIPPINCOTT, J. B. & CO., (*See* Class 6).

LOTHROP, D. & CO., Franklin street, Boston, Mass. (358.)
Books.

LOWELL, JOHN A. & CO., 147 Franklin street, Boston, Mass.
Specimens of Printing from Engraved Steel Plates.

MACCLURG, A. C. & CO., Wabash avenue, Chicago, Ill. (350.)
Books.

MASSACHUSETTS INSURANCE COMMISSION, Boston, Mass.
Annual Report of the Commission for 1888.

MERRIAM, G. C. & CO., Springfield, Mass. (*See* Class 6).

MITCHELL, J. J. CO. (The), 830 Broadway, New York. (412.)
Periodicals.

NATIONAL ACADEMY OF SCIENCE, Washington, D. C.
Three volumes of Memoirs.

NATIONAL ELECTRIC LIGHT ASSOCIATION, 16 E. 23d street, New York, N. Y.
Five volumes of Official Proceedings.

NAVY DEPARTMENT U. S., Washington, D. C.
Bureau of Medicine and Surgery. Ten volumes of the Annual Reports of the Surgeon-General, 1878–1888. Yellow fever on U. S. S. *Plymouth* and Instructions for Medical Officers.
Bureau of Provisions and Clothing. Regulations relating to Pay Department of the U. S. Navy, Pay-table, Report of Paymaster-General for 1888.
Bureau of Steam-Engineering. Report of a Standard Gauge for Bolt, Nut, and Screw-threads for the U. S. Navy, 1868.
Bureau of Yards and Docks. Origin, History, Laws, and Regulations of the United States Naval Asylum at Philadelphia, Pa. Report of Board of Civil Engineers on the Improvement of the Naval Station at New London, Conn. Report of Board of Civil Engineers for the Improvement of the Navy-Yard at Mare Island, California. Report of the Board of Civil Engineers for the Improvement of the Navy-Yard at League Island. History of the Navy-Yard at Gosport, Va.

Catalogue of exhibitors—Class 9.

NAVY DEPARTMENT U. S., Washington, D. C.—*Continued.*
Hydrographic Office. Publications.
Nautical Almanac Office. Publications.

NEW ENGLAND PUBLISHING COMPANY, Boston, Mass.
Current numbers of The Journal of Education and the American Teacher.

NEW YORK BANK-NOTE COMPANY, 1 Broadway, New York, N. Y. (521.)
Specimens of Bank-note Engraving.

NEW YORK STATE AGRICULTURAL SOCIETY, Albany, N. Y.
Transactions.

ORANGE JUDD & CO., 751 Broadway, New York City, (429)
Books.

OSMAN, BROTHER, Publisher, Ottawa, Ill.
Current numbers of The Brick, Tile, and Pottery Gazette.

OUTING PUBLISHING COMPANY, New York City.
Two volumes of Wheelman; two Wheelman and Outing; eight Outing.

PACKARD, Prof. A. S., BROWN UNIVERSITY, Providence, R. I.
Four volumes on Zoölogy and Entomology. Two on Embryology.

PERRIN & SMITH, St. Louis, Mo.
Current numbers of the American

RAILROAD COMMISSIONERS OF ALABAMA, Montgomery, Ala.
Two volumes of Annual Reports of the Board.

RAILROAD COMMISSIONER OF CONNECTICUT, Hartford, Conn.
Twelve volumes of reports of the board.

RAILROAD COMMISSION OF IOWA, Des Moines, Iowa.
A map of the State of Iowa and nine volumes of the annual reports of the commissioners.

RAILROAD COMMISSIONERS OF VIRGINIA, Richmond, Va.
One volume Report for 1888.

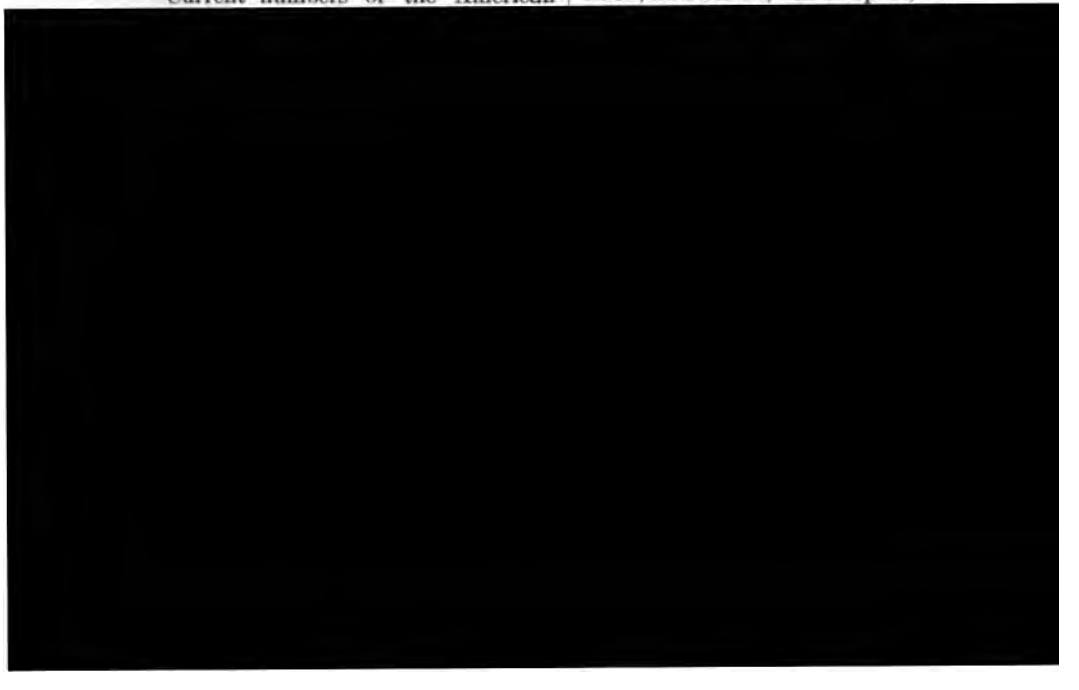
RAILROAD COMMISSION OF WISCONSIN, Madison, Wis.
Six volumes of annual reports of the railroad commission of Wisconsin.

RAILWAY COMMISSION OF OHIO, Columbus, Ohio.
Two volumes of the annual reports of the board.

RAND, MCNALLY & CO., 323 Broadway, New York. (198.)
Maps, map-cases, and atlases.

RANSOM, C. M., 178 Devonshire street, Boston, Mass. (462.)
Periodicals.

RAUB, ALBERT N., Philadelphia, Pa.



STATE DEPARTMENT, Washington, D. C.
Annual reports of the Secretary: consular reports.

STEARNS, J. W., Madison, Wis.
Current numbers of the Wisconsin Journal of Education.

STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, N. J.
Two bound volumes and current numbers of The Stevens Indicator: The Eccentric for 1888; The Bolt for 1887.

STOKES, FREDERICK A., publisher, 182 Fifth avenue, New York, N. Y. (390.)
Books.

SUMMERS, JAMES COLLING, 168 Nassau st., New York City. (208.)
A book entitled Who Won? The American Yacht Record and Guide.

TAINTOR BROTHERS & Co., 18 Astor Place, New York City. (396.)
Books.

TERQUEM, EMILE, 172 Mercer street, New York, N. Y. (132.)
Collective exhibit of books, prints, etc., from a number of American publishers. (Special catalogue.)

THE AMERICAN BAPTIST MISSIONARY UNION, Boston, Mass.
Three bound volumes and current numbers of the Baptist Missionary Magazine.

THE AMERICAN BOOKSELLER, New York City.

THE ENGINEERS' PUBLISHING COMPANY, Chicago, Ill.
Current numbers of the Street Railway Gazette.

THE FORUM PUBLISHING COMPANY, New York City.
Five bound volumes of The Forum, and current numbers for 1889.

THE MANUFACTURER AND BUILDER.
Eight volumes, 1881–1888.

THE PUBLISHERS' WEEKLY, New York City.
Publications.

THE TRADES PUBLISHING COMPANY, Philadelphia, Pa.
Current numbers of the Philadelphia Carpet Trade.

THE WILLIAMS PUBLISHING COMPANY, Cleveland, Ohio.
Michael's System of Penmanship. Michael's Compendium of Penmanship.

THOMAS, B. F., publisher, Chicago, Ill.
Current numbers of The Painters' Journal.

TIME PUBLISHING COMPANY, New York City.
Current numbers of Time.

TOVEY, A. E. J., 24 Park Place, New York, N. Y. (773.)
Current numbers and bound volumes of The Brewers' Journal.

TREASURY DEPARTMENT, Washington, D. C.
Annual reports of the Secretary of the Treasury.

UNIVERSITY PUBLISHING COMPANY, New York City.

VAILE, E. O., Chicago, Ill.
Current numbers of Intelligence.

VAN ANTWERP, BRAGG & Co., Cincinnati, Ohio.
Current numbers of The Alabama Teachers' Journal.

VERMONT STATE INSPECTOR OF FINANCE, Woodstock, Vt.
Annual report. Laws of Vermont relating to banks, trusts, etc.

WAR DEPARTMENT, Washington, D. C.
Surgeon-General's office. Parts of the medical and surgical history of the United States; annual report of Secretary: Paymaster-General's reports; Quartermaster-General's reports; Chief Engineer's reports and professional papers.

WARREN S. EDWARD. (*See* Classes 6, 7, 8.)

WHITE, BETSY ANN, Bellingham, Mass. (272.)
Volume entitled Three Holes in a Chimney.

WILEY, JOHN & SONS. (*See* Class 6, 7, 8.)

WILLIAMS, DAVID, New York City. (230.)
Current numbers of The Office, The Metal Worker, The Iron Age, The Pharmaceutical Record, and The Carpenter and Builder.

WORTHINGTON, GEORGE, New York City.
Current numbers of the Electrical Review.

YOUNG, W. H., Troy, N. Y.
Five volumes of fine press-work.

Catalogue of exhibitors—Class 10.

CLASS 10.—STATIONERY, BOOKBINDING, AND ARTICLES USED IN PAINTING AND DRAWING.

ADIRONDACK PULP COMPANY (The), Troy, N. Y. (774.)
Fibrous, mineral, and pure talc in different stages of manufacture, from talc to the finished product called mineral fiber pulp.

BROWN, L. L., PAPER COMPANY, Greylock Paper Mills, Adams, Mass. (460.)
Linen ledger and record papers, for blank books.

CARTER, DINSMORE & COMPANY, 162 Columbus Avenue, Boston, Mass. (407.)
Writing, copying, indelible, and safety inks; mucilage; liquid glue.

CASE, BRAINARD & LOCKWOOD COMPANY, Hartford, Conn., blank book for register.

CAW'S INK AND PEN COMPANY, 189 Broadway, New York, N. Y. (189.)
Inks and pens. Gold pens, pen and pencil cases.

FAIRCHILD, LEROY W., & CO., 189 Broadway, New York, N. Y., G. W. Fairchild, 14 rue de la Trémoille, Paris. (246.)

LITTLE, A. P., New York City. (809.)
Type-writer supplies,

LOWELL, JOHN A. & CO., Boston, Mass.
Framed engravings.

STORY & FOX, 127 Erie street, Buffalo, N. Y. (464.)
Specimens of steam-power varnishing and finishing of lithographs, gumming and sizing and tin japanning, paper tags, labels, etc.

TIFFANY & CO., New York City. (135.)
Engravings for cards and letter-heads.

UNDERWOOD, JOHN & CO., 30 Vesey street, New York, N. Y. (475.)
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WARREN, S. D., & CO., Boston, Mass. (687.)
Fine grades printing paper.

WATERMAN, L. E. CO., 155 Broadway, New York, N. Y. (760.)
Fountain pens.

WEEKS & CAMPBELL, 32 Warren street, New York, N. Y. (136.)
Advertising specialties in leather and celluloid, memorandum books, calendars, blotters, tablets, signs, etc.

CLASS 11.—ORDINARY APPLICATION OF THE ARTS OF DRAWING AND MODELING.

ASSOCIATED ARTISTS OF CINCINNATI, Ohio.
Nineteen pieces of decorated metal; fifty pieces of decorated pottery.

BALDWIN & GLEASON CO., limited, 61

HARRIS, NATHANIEL R., 811 Ellsworth street, Philadelphia, Pa. (185.)
Designs for cabinet furniture.

LOWELL, JOHN A. & Co. (*See* Class 9.)

MAILLARD, HENRY, New York. (15.)
The Venus de Milo molded in chocolate; weight, 700 kilograms (1,400 pounds).

MORGAN, W. E., 180 and 182 Washington street, Chicago, Ill.
Heraldic Engraving. Dies. Stamps.

PRANG, L. & Co. (*See* Class 9.)

RATH, ARTHUR, 58 Ann street, New York, N. Y. (88.)
Vignettes engraved on stone (lithography).

TIFFANY & Co. (*See* Class 10, etc.).

CLASS 12.—PHOTOGRAPHIC PROOFS AND APPARATUS.

ALMAN, LOUIS, 172 Fifth avenue, New York, N. Y. (380.)
Photographs.

BARKER, GEORGE, Niagara Falls, N. Y. (628.)
Instantaneous photographs of Niagara, Florida, and other American scenery.

BEAL, J. H., 278 Pearl street, New York, N. Y. (655.)
Large photographic views.

BLOCH, BENOIT, 179 Myrtle avenue, Brooklyn, N. Y. (550.)
Photographs representing the four seasons.

CLARK, D. R., 2134 Michigan boulevard, Chicago, Ill. (514.)
Photographs.

COOLIDGE, BALDWIN, Boston, Mass.
Twenty-four photographs, exteriors and interiors.

COX, G. C., 826 Broadway, New York, N. Y. (637.)
Framed photographs.

EASTMAN DRY PLATE AND FILM COMPANY, Rochester, N. Y. (524.)
Photographic apparatus and materials. Kodak camera.

GUERIN, F. W., 1137 Washington avenue, St. Louis, Mo. (295.)
Framed photographs.

LANDY, JAMES, Cincinnati, Ohio. (338.)
Framed photographs.

LLOYD, JAMES, Troy, N. Y.
Thirty photographs of groups.

MARX, ERNEST, Plainfield, N. J. (815.)
Instantaneous photographs of animals.

ROWLAND, HENRY A., Baltimore, Md.
Photographs of the normal and carbon spectrums.

RYDER, J. F., 239 to 243 Superior street, Cleveland, Ohio. (743.)
Framed photographs.

SCHOLTEN, JOHN A., 920 and 922 Olive street, St. Louis, Mo. (440.)
Framed photographs.

SEAVEY, LAFAYETTE W., 216 East Ninth street, New York City. (651.)
Photographic backgrounds and accessories.

SMITH & PATTISON, 261 and 263 State street, Chicago, Ill. (781.)
Quadruple enameler for burnishing photographs.

SMITH, SYDNEY M., Commissioner from the State of California, San Francisco, Cal. (817.)
Photographic views, by Matthews, illustrating the Lick telescope and the observatory.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK, C. W. Canfield, president, 122 West Thirty-sixth street, New York City. (297.)
Photographs. A collective exhibition of the work of the members.

STEIN, S. L., Milwaukee, Wis.
Photographs.

TABOR, H., photographer, San Francisco, Cal. (668.)
Photographs of the corona of the sun.

THORS, corner Larkin and Sutter streets, San Francisco, Cal.
Instantaneous photographs.

U. S. GEOLOGICAL SURVEY, J. W. Powell, Director. (757.)
Photographic views on glass of scenery, Indians, etc.

UNIVERSITY OF CALIFORNIA, Lick Observatory, E. S. Holden, director, Berkeley, Cal. (620.)
Photographs of Lick Observatory. Photographs of the moon, etc.

VANDERBILT, J. W., Alaska. (896.)
Photographic views of Alaska Territory.

WOOD, GEORGE B., Drexel Building, Philadelphia, Pa. (688.)
Photographs.

Catalogue of exhibitors—Class 17.

CLASS 13.—MUSICAL INSTRUMENTS.

BOHMAN, JOSEPH, Chicago, Ill. (247.)
Violins, guitars, zithers, etc.

DION, CHARLES, 7 rue de l'Arcade, Paris, France. (211.)
Four improved violins on Dion's new system of bridge.

WEBER, ALBERT, 108 Fifth avenue, New York City. (293.)
Four pianos.

CLASS 14.—MEDICINE AND SURGERY—VETERINARY AND COMPARATIVE MEDICINE.

ARMOUR & CO., Chicago, Ill. (840.)
Extract of meat.

BROWN, E. PARMLEY, Flushing, N. Y. (186.)
Specimens of dental work and appliances for dentists' use.

FARRINGTON, CLEOPATRA K., 17 Allston street, Boston, Mass. (123.)
The obelisk, an abdominal and spinal supporter made of hard rubber, without springs.

FELL, GEORGE E., 72 Niagara street, Buffalo, N. Y. (393.)
Apparatus to keep up the respiration of asphyxiated human beings.

FREES, C. A., 766 Broadway, New York City. (9.)

SEABURY & JOHNSON, 21 Platt street, New York City, and 46 Jewin street, London, E. C. (329.)
Manufacturers of pharmacopœial, medicinal, and surgical plasters, antiseptic dressings, absorbents, splints, and surgical specialties.

CLASS 15.—INSTRUMENTS OF PRECISION.

BOOTH, MARY A., Longmeadow, Mass. (370.)
Microscopical preparations of various objects, mounted on slips.

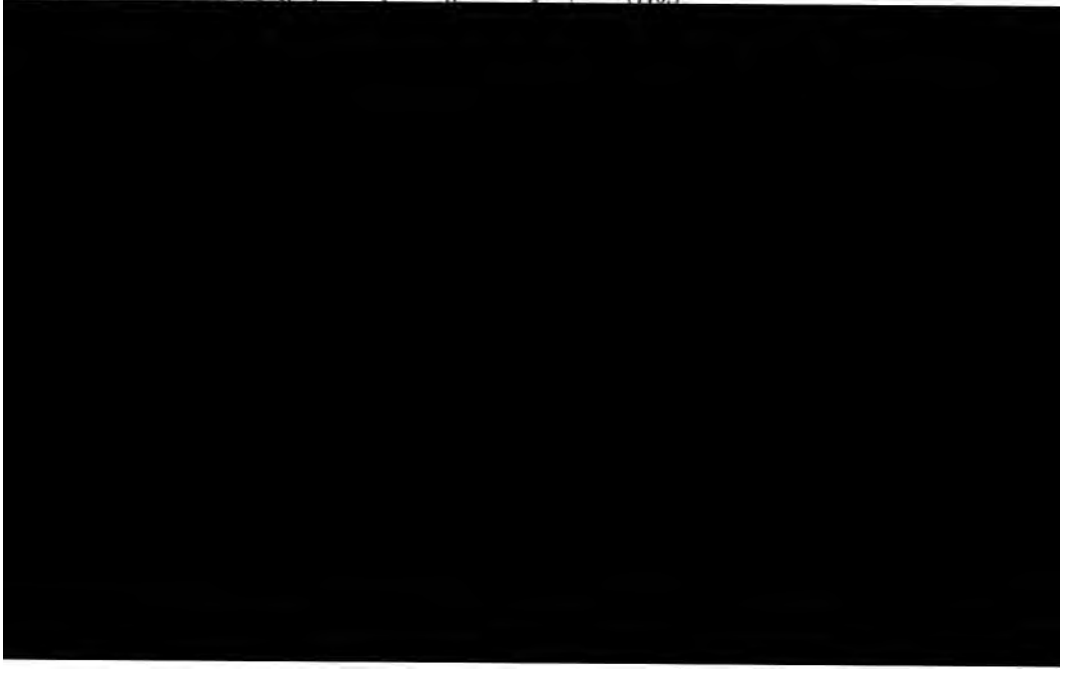
DARLING, BROWN & SHARPE, Providence, R. I. (156.)
Rules, try-squares, gauges, and measuring instruments.

HOLLERITH, HERMAN, 617 Seventh street, Washington, D. C. (274.)
Electrical and mechanical apparatus for compiling census and similar statistics.

LUBIN, SIEGMUND, 237 North Eighth street, Philadelphia, Pa. (269.)
Optical goods; eye-glasses and spectacles; eye-tester.

LUGANO, C., Kingston, N. Y. (753.)
Eye and opera glasses.

McDONALD, ALEXANDER E., 223 Schermerhorn street, Brooklyn, N. Y. (776.)



UNITED STATES NAVAL OBSERVATORY, Capt. R. L. Phythian, Superintendent, Washington, D.C. (824.)
Gardner's system of observatory electric time signals, controlling clocks, dropping time balls, and other signals.

WETZEL, JOHN, Salt Lake City, Utah. (490.)
Patent self-measurement chart for fitting boots and shoes.

CLASS 16.—GEOGRAPHICAL AND COSMOGRAPHICAL MAPS AND APPARATUS. TOPOGRAPHY.

COLVIN, VERPLANCK, Superintendent of the New York State Adirondack Survey, Albany, N.Y.
Reports on Adirondack surveys.

COOK, G. H., State geologist of New Jersey, New Brunswick, N. J. (Contributor).
Final reports of surveys, with maps.

CORPS OF ENGINEERS, United States Army, Washington, D.C.
Charts and reports.

DEPARTMENT OF AGRICULTURE, Washington, D.C. (734.)
Maps showing the geographical distribution of mammals and birds of economic importance.

FOOTE, ALBERT EDWARD, 1223 Belmont avenue, Philadelphia, Pa. (798.)
Geological maps and reports. (See also class 8).

GEOLOGICAL SURVEY OF WISCONSIN, Madison, Wis., T. C. Chamberlin, Chief.
Four volumes of the report and three portfolios of maps of the survey.

HALL, JAMES H., C. E., Albany, N. Y.
Various reports of geological surveys.

HYDROGRAPHIC OFFICE, Navy Department, Washington, D.C.
Charts.

LESLEY, J. P., State geologist of Pennsylvania, Harrisburg, Pa. (Contributor).
Second geological survey of Pennsylvania, 48 volumes, with 18 portfolios of maps, and 6 atlases.

MINNESOTA STATE GEOLOGICAL SURVEY, Minneapolis, Minn.
Annual reports.

OSBORN, Prof. HENRY S., Oxford, Ohio. (255.)
Large wall maps of Palestine and part of Syria.

RAND, MCNALLY & CO., New York, N.Y., Chicago, Ill. (198.) (*See* Class 6.)
Mounted maps, map cases, atlases.

UNITED STATES COAST SURVEY, Washington, D. C.
Charts.

UNITED STATES GEOLOGICAL SURVEY, Washington, D. C. (*See* Class 8.)

UNITED STATES SIGNAL SERVICE, Washington, D. C. (*See* Class 15.)

WHITEHOUSE, FREDERIC COPE, care of Whitehouse & Co., corner Broad street and Exchange Place, New York, N. Y. (335.)
A relief map of the Raiyan and Fayoum depressions in Middle Egypt, from original surveys, with complete details of the ancient canal, the Bahr Jusut or River of Joseph, and the New Raiyan canal and reservoir.

WINCHELL, N. H., Minneapolis, Minn.
Reports and Charts of the State Geological Survey of Minnesota.

GROUP 3.—FURNITURE AND ACCESSORIES.

CLASS 17.—CHEAP AND FINE FURNITURE.

BRUNSWICK, BALKE, COLLENDER CO., H. W. Collender, president, 806 Broadway, New York, N. Y. (29.)
Billiard tables, billiard balls, and articles relating to the game of billiards.

CUTLER, A., & SON, 166 Pearl street, Buffalo, N. Y. (313.)
Furniture: Desks, chairs, tables, shaving stands.

DERBY & KILMER DESK CO., Somerville, Mass. (165.)
Office furniture: Roll-top desks, letter-press stand, chairs.

HEYWOOD BROS. & CO., 297 Cherry street, New York, N. Y. (433.)
Chairs, rattan furniture, and children's carriages.

LAMBIE, R. M., 39 East Nineteenth street, New York, N. Y. (331.)
Book-holder.

Catalogue of exhibitors—Class 18.

MARKS ADJUSTABLE FOLDING CHAIR CO., 930 Broadway, New York, N. Y. (13.)
Adjustable reclining chairs.

MERKLEN BROTHERS, 390 East Third street, New York, N. Y. (592.)
Spiral furniture.

PIKE, WILLIAM H., 206 Broadway, New York, N. Y. (173.)
Bow-guide and music-holder for violin.

WINDSOR FOLDING BED CO., Chicago, Ill. (835.)
Folding beds.

CLASS 18.—UPHOLSTERERS' AND DECORATORS' WORK.

AMERICAN BRAIDED WIRE CO., Joseph L. Wells, president, 1017 Chestnut street, Philadelphia, Pa. (109.)
Torsion braided wire mattresses, pillows, and springs for upholstery.

EVANHOE, FRANK N., 300 Mulberry street, New York, N. Y. (164.)
An emblematic design, embroidered in silk by Miss Mary J. Fay.

HARTFORD WOVEN WIRE MATTRESS CO., Henry Roberts, president, 618 Capitol avenue, Hartford, Conn. (227.)
Woven wire mattresses, iron bedsteads.

KNITTED MATTRESS CO., Geo. F. Sumner, president, Canton, Mass. (666.)
Mattresses, carpet lining, etc.

VIZET, V., New Rochelle, New York.

GREENOUGH, WALTER C., 61 Washington square, New York. (634.)
Stained glass window; painted opalescent glass.

HAWKES, T. G., Corning, N. Y. (670.)
Cut crystal.

HEALY & MILLET, 22 Wabash avenue, Chicago, Ill. (756.)
Stained glass.

HEIDT, LOUIS, Brooklyn, N. Y. (905.)
Four frames leaded stained glass; four frames stained glass in putty.

HENRY, C. EDWARD, Kokomo, Howard County, Ind. (676.)
Opalescent glass made in sheets; all colors.

LA FARGE, JOHN, 51 West Tenth street, New York, N. Y. (377.)
Artistic stained glass.

MACBETH, GEORGE A., & Co., Pittsburgh, Pa. (418.)
Lamp chimneys and globes for lanterns, clear and colored.

MALLON, JOHN, Pacific Art Glass-Works, Howard street, San Francisco, Cal. (442.)
One art glass window: Subject, "The Graduate," taken from life.

TIFFANY & Co. (*See* Class 37.)

WESTERN GLASS SIGN WORKS, 309 Michigan street, Buffalo, N. Y. (278.)
Specimens of embossed glass signs and artistic decorations on glass.

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CLASS 23.—CUTLERY, KNIVES, PENKNIVES, SCISSORS, RAZORS, ETC. VARIOUS ARTICLES OF CUTLERY.

DE BERNALES & CO., 67 New street, New York, N. Y. (626.)
Household cutlery, nickeled, and which does not require polishing.

PHILADELPHIA NOVELTY CO., Philadelphia, Pa. (328.)
"Novelty" pocket knives and knives for special purposes.

TIFFANY & CO., Union square, New York, N. Y. (135.)
Table knives and toilet cutlery with mountings of ivory and of silver.

CLASS 24.—GOLDSMITHS' AND SILVERSMITHS' WORK.

COOK, G. R., & CO., 92 Chambers street, New York. (873.)
Pickle forks, table specialties.

FAIRCHILD, LEROY W., & CO., 189 Broadway, New York. (246.)
Gold pens, pencil cases, fountain pens, match-boxes, cigarette cases, flasks, pocket knives, whistles, cigar cutters, fancy pen-holders, etc. In gold, silver, and rolled-gold plate.

GORHAM MANUFACTURING CO., Edward Holbrook, treasurer, Broadway and Nineteenth street, New York, N. Y. (153.)
Solid silver ware.

MERIDEN BRITANNIA CO., Meriden, Conn. (445.)
Silver-plated ware.

PARKER, M. E., Boston, Mass. (891.)
Art scale works.

TIFFANY & CO., Union square, New York, N. Y. (135.)
Silver ware for household use, the table, the toilet, and for ornament, decorated with chasing, etching, niello, enameling, jeweling, and inlays of metal.

CLASS 25.—ART BRONZES AND CASTINGS. ARTISTIC IRON-WORK AND REPOUSSÉ METAL-WORK.

MCLAUGHLIN, M. LOUISE, Walnut Hills, Cincinnati, Ohio.
Repoussé work in copper and brass, panels, vases, clock-faces, etc.

CLASS 26.—WATCHES AND CLOCKS.

GILES, F. S., State street, Chicago, Ill. (884.)
Anti-magnetic shield for watches.

HEINRICH, H. H., 14 John street, New York, N. Y. (373.)
Chronometers.

KAHENN, A., & CO., St. Louis, Mo. (702.)
Clocks and watches for railway service, etc.

ROGERS AUTOMATIC STAMP CO., Providence, R. I. (799.)
Automatic dating stamp.

THOMAS (SETH) CLOCK CO., Thomaston, Conn., and 20 Murray street, New York City.
Clocks of precision.

TIFFANY & CO., Union square, New York, N. Y. (135.)
Hall clocks.

TRENTON WATCH CO., 177 Broadway, New York, N. Y. (770.)
Watches, cased in gold, gold filled, silverine, and nickel.

WATERBURY WATCH CO., Waterbury, Conn. (45.)
Waterbury watches.

CLASS 27.—APPARATUS AND PROCESSES FOR HEATING. APPARATUS AND PROCESSES FOR LIGHTING OTHERWISE THAN BY ELECTRICITY.

DE BERNALES & CO., 67 New street, New York, N. Y. (626.)
Lamps of all kinds, made of paper and unbreakable.

DOPP, H. WM., & SON, 462 Ellicot street, Buffalo, N. Y. (410.)
Steam-jacketed, cast-iron kettles.

FRANK F. A., 316 East Eighty-second street, New York, N. Y. (391.)
Cook-stoves.

MICHIGAN RADIATOR AND IRON MANUFACTURING CO., Detroit, Mich. (470.)
Steam and hot-water radiators.

NUTRIZIO, HENRY, Beekman and William streets, New York, N. Y. (94.)
Coffee-pots.

PHILADELPHIA NOVELTY MANUFACTURING CO., Philadelphia, Pa. (328.)
Gas burners and gas fixtures.

Catalogue of exhibitors—Class 28.

PIKE, WM. HENRY, 206 Broadway, New York, N. Y. (173.)
Tea-pots, gas burners, and stoves

REID, ADAM, 119 Main street, Buffalo, N. Y. (388.)
Portable oven.

ROCHESTER LAMP CO., 25 Warren street, New York, N. Y. (698.)
Lamp and gas burners.

SHEPARD, SIDNEY & Co., 145 Seneca street, Buffalo, N. Y. (309.)
Stove-pipe damper, flour sifter, steam egg poacher, mincing knife.

SIMPSON, L. A., 12 rue Bacon, Paris. (827.)
Universal Stove.

VIZET, V., New Rochelle, N. Y. (400.)
Gas bracket.

CLASS 28.—PERFUMERY.

COLGATE & CO., 55 John street, New York, N. Y. (267.)
Perfumery, toilet soaps, toilet articles, powders, essences, etc.

DOUSSAN FRENCH PERFUMERY CO., Chas. K. Hall, president, New Orleans, La. (473.)
Perfumery, powders for the face, soaps.

HARTRICK, ED., San Francisco, Cal. (97.)
California perfumes, toilet soaps, and waters.

HOUGHTON, W. V., & Co., 1664 Lamont street, Cleveland, Ohio. (113.)

SHEFFIELD, L. T., 26 West Thirty-second street, New York, N. Y. (494.)
Crème Dentifrice in tubes and in jars; Elixir Balm in bottles.

CLASS 29.—LEATHER WORK, FANCY WOODEN ARTICLES, BASKETS, AND BRUSHES.

AUGANES, HANS, 440 Seminary avenue, Chicago, Ill. (621.)
Wood carving: Glove-box, breastpin, napkin-ring, paper-knife.

BAILEY, C. J., & Co., 132 Pearl street, Boston, Mass. (75.)
Patent rubber bath, flesh, toilet, tooth, and erasive brushes.

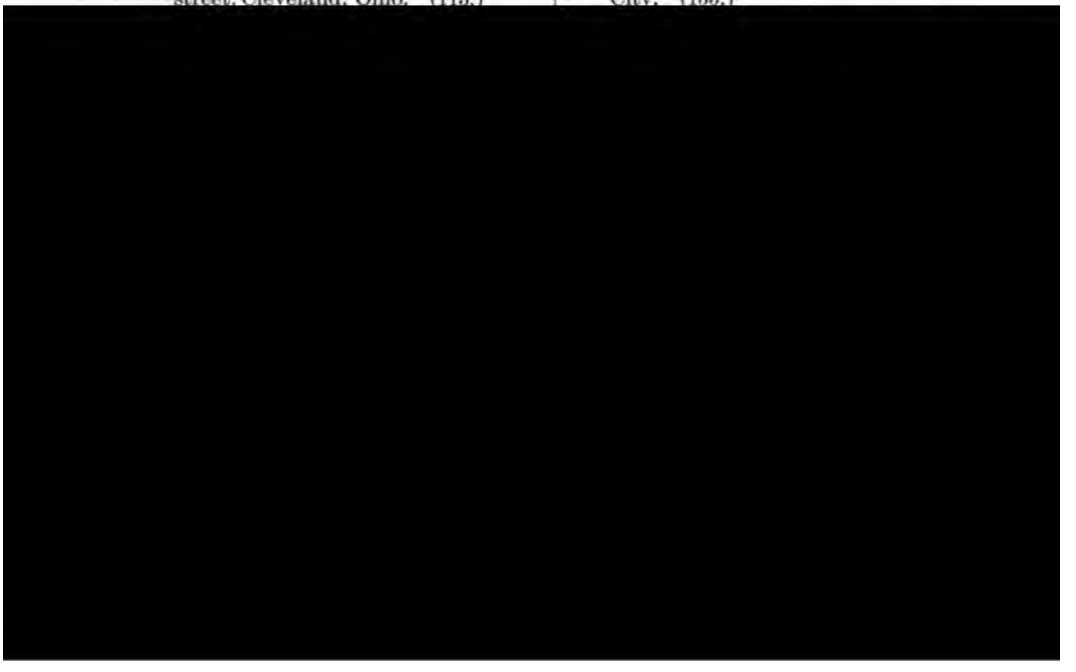
BISSELL CARPET SWEEPER CO., Grand Rapids, Mich., and 103 Chambers street, New York, N. Y. (22.)
Carpet-sweepers for sweeping floors of all descriptions, whether covered or bare.

CASTLE CARPET SWEEPER, Geneva, Ohio. (454.)
Carpet Sweepers.

DEMUTH, WILLIAM, & Co., 507 Broadway, New York, N. Y. (249.)
Manufacturers of meerschaum and briarwood: Show-piece and pipes.

ESTES, E. B., & SONS, 254 Pearl street, New York, N. Y. (121.)
Turned wooden-ware of all kinds.

GORHAM MANUFACTURING CO., New York City. (153.)



SCHRAMM, H. GOTTFRIED, 521 North Second street, Camden, N. J. (305.)
A collection of smoking devices, to show different arrangements and improvements in smoking tobacco and for fumigating.

TIFFANY & Co., Union square, New York, N. Y. (135.)
Fine leather goods, pocket-books, purses, note-books, card-cases, portfolios, cigar and cigarette cases, blotters, pads, and various articles for the library table in fine leather and skins, richly mounted in gold and silver. Ivory articles for the toilet and for library tables, richly carved, and mounted in gold and silver, chased, etched, enameled, inlaid.

TORREY & Co., Worcester, Mass. (459.)
Razor strops.

GROUP 4.—TEXTILE FABRICS, WEARING APPAREL AND ACCESSORIES.

CLASS 30.—COTTON THREAD AND FABRICS.

ARLINGTON MILLS, Lawrence, Mass.
Robert Redford, agent.
Illustrations of partial processes in manufacture of spun yarn used by manufacturers for covering wire.

ATLANTIC COTTON MILLS, Lawrence, Mass., T. W. Sherman, agent.
Manufacture of white cotton goods and sheeting.

GARNER & Co., 2 Worth street, New York, N. Y. (318.)
Printed cotton fabrics.

LANE MILLS, New Orleans, La.
Manufacture of "Odenheimer cotton bagging," bagging and twine.

WILLIMANTIC LINEN Co., Willimantic, Conn., E. S. Boss, agent.
Series illustrating conversion of raw cotton into spool thread.

CLASS 31.—THREAD AND FABRICS OF HEMP, FLAX, ETC.

DEPARTMENT OF AGRICULTURE, Washington, D. C. (734.)
Manufactured American flax fiber.

HART, A. H., & Co., White street, New York.
Illustration of the manufacture of hemp and *flax twine*.

KENTUCKY RIVER MILLS, Frankfort, Ky.
Illustrations of manufacture of hemp binder twine.

CLASS 32.—THREADS AND FABRICS OF COMBED WOOL, THREADS AND FABRICS OF CARDED WOOL.

ARLINGTON MILLS, Lawrence, Mass.
Series illustrating the various processes in the manufacture of ladies' dress goods.

DEPARTMENT OF AGRICULTURE, Washington, D. C. (734.)
Collective exhibit of wool.

MIDDLESEX MILLS, Lowell, Mass.
Series illustrating partial processes in the manufacture of yacht cloth.

UNITED STATES BUNTING Co., Lowell, Mass.
Series illustrating partial processes in the manufacture of bunting for flags.

CLASS 33.

CHENEY BROTHERS, Manchester, Conn.
Silk flags for decoration of United States sections.

DEPARTMENT OF AGRICULTURE, Washington, D. C.
Raw silk reeled in the experimental filature at Washington, artistically arranged to show the arms of the United States.
Raw silk reeled in the United States from worms fed on *Maclura aurantiaca*.

CLASS 34.—LACES, NET, EMBROIDERY, AND TRIMMINGS.

CASTLE BRAID Co., 15 Mercer street, New York. (330.)
Manufactured braid.

CLASS 35.—ARTICLES OF HOSIERY AND UNDERCLOTHING, ACCESSORIES OF WEARING APPAREL.

AMERICAN BRAIDED WIRE Co., Philadelphia, Pa. (109.)
Wire work for women's dress.

CHANUT, J. M., 2 West Fourteenth street, New York City. (601.)
Kid gloves.

FOLLMER, CLOGG & Co., 414 Broadway, New York. (838.)
Umbrellas, canes, etc.

Catalogue of exhibitors—Class 36.

INTERNATIONAL FASTENER CO., 10 Wall street, New York, N. Y. (368.)
American corsets, with the Calumet corset clasp.

LYON, AMASA, & CO., H. E. Nicolay, secretary, 684 Broadway, New York, N. Y. (86.)
Umbrellas, parasols, walking sticks, whips, and handles for these goods.

MAYER, STROUSE & CO., 412 Broadway, New York, N. Y. (72.)
Manufactured corsets and clasps.

NOYES, JOSEPH P., Binghamton, N. Y. (150.)
Buttons for attaching to clothes automatically.

SIEGEL BROS., 65 Wooster street, New York, N. Y. (334.)
Ladies' and children's underwear.

ROTH & GOLDSCHMIDT, 16 Walker street, New York, N. Y. (409.)
Corsets.

WOGAN, A. R., & CO., 55 Boerum street, Brooklyn, N. Y. (796.)
Fancy jet and other buttons.

CLASS 36.—WEARING APPAREL FOR BOTH SEXES.

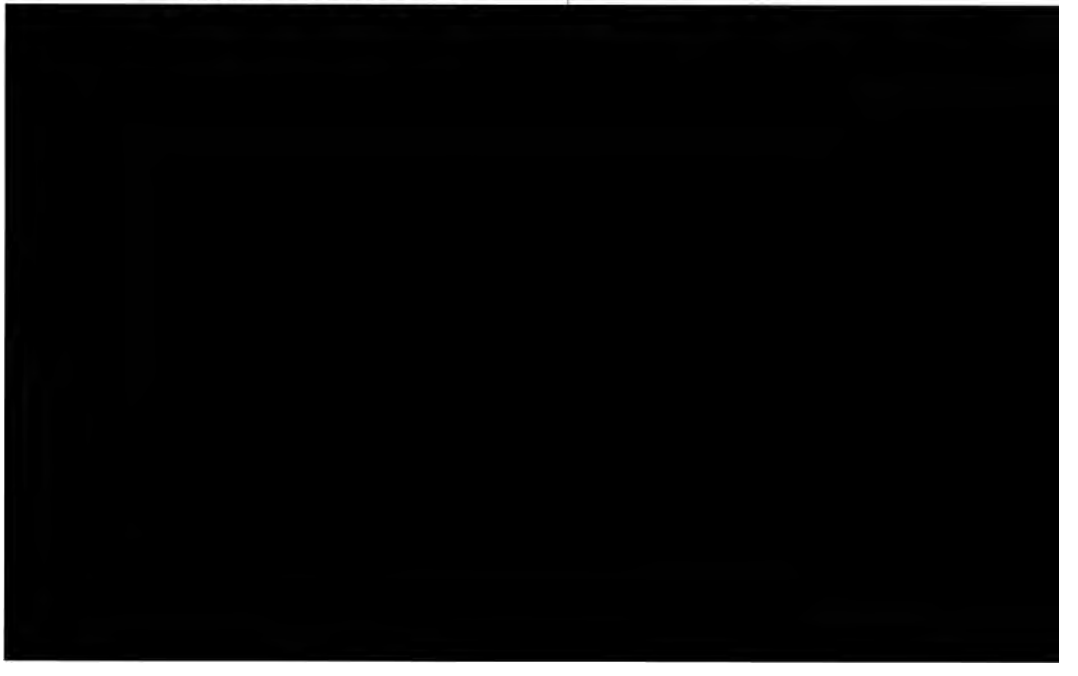
BENEKE BROS., 199 Canal street, New York, N. Y. (816.)
Hand-made boots and shoes.

SHILLABER & CO., Lynn, Mass. (94.)
Ladies' and misses' boots and shoes.

STETSON, JOHN B., CO., Fourth street and Montgomery avenue, Philadelphia, Pa. (11.)
Fine fur hats, soft and stiff felt hats.

WAR DEPARTMENT, Washington, D. C., Quartermaster - General's Department, U. S. Army.
Lay figures illustrating the historic uniforms of the American Army.
Group A.—1. Field officer, infantry regiment, 1776. 2. Officer, Washington guards, 1776. 3. Rawlings Maryland Rifleman, 1776. 4. Infantry soldier, Pennsylvania regiment, 1776. 5. Artillery soldier, Continental Army, 1777. 6. Morgan Virginia Riflemen, 1776.
Group B.—7. Brigadier-general, Continental Army, 1780. 8. Aides-de-camp, Continental Army, 1780. 9. Light dragoon, Continental Army, 1782. 10. Infantry soldier, Continental Army, 1782.
Group C.—11. Flying dragoon, 1812. 12. Artillery soldier, 1812. 13. Infantry soldier, 1812.

CLASS 37.—JEWELRY AND PRECIOUS STONES.



HORTON, ANGELL & Co., Attleborough, Mass. (307.)
Sleeve buttons, collar buttons, studs, and other jewelry; chains, charms, rings, etc.

KENT & STANLEY, Providence, R. I. (766.)
Seamless filled gold chains.

RIDER, S. A., & Co., 502, 504, 506 North Sixth street, St. Louis, Mo. (6.)
Hot Springs white-stone brilliants, Florida shell and sea-bean work, alligator teeth jewelry.

TIFFANY & Co., Union square, New York, N. Y.
Jewelry of precious metals, chased, carved, enameled; inlays of precious metals, etched, engraved, and mounted, filagreed, adorned with precious stones and pearls; diamonds and other precious stones, unset, cut, and uncut; carved rock crystal, American cutting, American pearls.

UIBEL & BARBER, 39 Vesey street, New York, N. Y. (339.)
Alligator teeth, sea-bean, and sea-shell jewelry.

CLASS 38.—PORTABLE WEAPONS, HUNTING.

BAILEY, FARREL & Co., 619 Smithfield street, Pittsburgh, Pa. (404.)
Automatic cartridge-loaders.

COLT'S PATENT FIRE-ARMS MANUFACTURING Co., Hartford, Conn. (157.)
Fire-arms, pistols, rifles, and revolvers.

SMITH & WESSON, Springfield, Mass. (379.)
Revolvers.

STANDARD TARGET Co., 121 Superior street, Cleveland, Ohio. (303.)
Target traps and cases of targets.

UNION METALLIC CARTRIDGE Co., M. Hartley, president, Bridgeport, Conn. (493.)
Models of ammunition.

WINCHESTER REPEATING ARMS Co., New Haven, Conn. (263.)
Fire-arms, sporting and military metallic ammunition, reloading tools.

CLASS 39.—ARTICLES FOR TRAVELING AND CAMP EQUIPAGE.

BOSTON RUBBER SHOE Co., Boston, Mass. (530.)
Rubber boots and shoes.

FOLDING TRUNK Co., 712 Broadway, New York, N. Y. (220.)
Patent folding trunks.

LAWRENCE, R. F., & Co., 196 Pearl street, Buffalo, N. Y. (485.)
Bouquet holders.

MARKS ADJUSTABLE FOLDING-CHAIR Co. (limited), F. R. Marks, president, 980 Broadway, New York, N. Y. (13.)
Adjustable folding chairs, gynæcological chairs, railway-car chairs, invalid rolling chairs, adjustable reading and writing desks.

CLASS 40.—TOYS.

GENDRON IRON WHEEL Co., J. F. Vogel, secretary, Toledo, Ohio. (243.)
Children's carriages, velocipedes, bicycles, tricycles, toy express wagons, barrows, etc.

HOWARD, A. H., 220 Devonshire street, Boston, Mass. (478.)
Boston chest-weight, a gymnastic appliance for the house or gymnasium.

PIERCE, GEORGE N., & Co., Prime street, corner of Hanover street, Buffalo, N. Y. (511.)
Tricycle and bird cage.

GROUP 5. EXTRACTIVE ARTS, RAW AND MANUFACTURED PRODUCTS.

CLASS 41.—PRODUCTS OF MINING AND METALLURGY.

ABRAHAM, L. C., & BROS., 106 Canal street, Cleveland, Ohio. (322.)
Steel brushes, steel brooms, and combination brushes.

ABEL, LINDLEY, Bayard, Yavapai County, Ariz.
Copper pyrites vein, bearing gold, from Humbug Gulch; gold ore from the Cleveland lode.

ADAM, J. S., & Co., Canaan, Conn.
Specimen of magnesian limestone used for the manufacture of lime.

Catalogue of exhibitors--Class 41.

ADAMS, F. F., & Co., Erie, Pa. (763.)
Household utensils and cork-pullers.

ADIRONDACK PULP Co., Troy, N. Y. (744.)
Talc as mined; pulp made from talc.

ALICE GOLD AND SILVER MINING Co., W. E. Hall, superintendent, Walkerville, Mont.
Silver and gold from Alice Mine.

AMERICAN BIT BRACE Co., 124 Washington street, Buffalo, N. Y. (216.)
Bit braces and other mechanical tools.

ANACONDA MINING Co., Marcus Daly, superintendent.
Butte and Anaconda, Mont., copper ore, copper ore concentrates; copper matte.

AUSABLE HORSE NAIL Co., 4 Warren street, New York, N. Y. (192.)
Horseshoe nails.

BAILEY, GEORGE M., 47 Chapin Block, Buffalo, N. Y. (218.)
Collection of models of inventions; hardware and house-furnishing specialties, and small specimens of mechanism.

BAILEY, R. S., Silver Creek, N. Y. (477.)
Combination system for cutting ladies' and children's garments and men's shirts.

BARNUM, RICHARDSON & Co., Lime Rock, Conn.

BRISTOL COPPER AND SILVER MINING Co., Bristol, Conn., G. E. Hubbel, manager.
Specimens of copper ore from the Bristol Mine.

BUNKER HILL MINING AND CONCENTRATING Co., T. G. Reed, president, Wardner, Idaho, and Portland, Oregon.
Lead ores containing silver from the company's mines in the Cœur d'Alene Mountains, Idaho.

BUNKER HILL AND SULLIVAN MINING Co.
Lead.

CACTUS MINING Co., Frisco, Beaver County, Utah, W. L. Lay, agent. (822.)
Ores and minerals, copper matte, etc.

CAPITOL MANUFACTURING Co., Chicago, Ill. (535.)
Wrenches (monkey and pipe).

CARLISLE GOLD MINING Co., Carlisle, N. Mex. (696.)
Gold ore and sample of concentrate.

CASTLE, WILLIAM H., Geneva, Ohio. (454.)
Carpet sweepers, animal traps, pillow-sham holders, bracket clothes bars, etc.

CLEVELAND TIN MINING Co., Deadwood, Black Hills, Dak.
Tin ores and tin from Dakota.

COLLECTIVE EXHIBITION of examples of

COLLECTIVE EXHIBITION, ETC.—*Cont'd.*

Brown, Will Q., nickel ores.
Bunker Hill and Sullivan Mining Co., lead
Cactus Mining Co., copper and silver.
Canfield, Frederick A., iron ore.
Carlisle Gold Mining Co., gold ore.
Chambers, R. C., silver ores.
Chateaugay Ore and Iron Co., iron ore.
Cleveland Tin Mining Co., tin ore.
Comfort Consolidated Mining Co., gold ore.
Comfort, S., treasurer, gold ore.
Congress Mine, gold sulphurets.
Copper Basin Mining Co., copper ores.
Cowles Electric Smelting and Aluminum Co., aluminum alloys.
Daly, Marcus, copper ores.
Daly Mining Co., silver ores.
Davis Co., The, pyrites.
Davis, H. J., pyrites.
Day, Fred. W., antimony ore.
Dead Horse Claim, gold ore.
Deadwood Terra Mining Co., gold ore.
Delaware and Hudson Canal Co., anthracite coal.
Delhi Mine, gold ore.
Dickerson Suckasunny Mining Co., magnetic iron ore.
Drake, James B., president, ornamental stone.
Drake Co., The, ornamental stone.
Empire Original Gold Mining Co., gold.
Germain, H., superintendent, gypsum.
Grey Eagle Mine, gold ore.
Haggin, J. B., president, copper and gold ores.
Hague, James D., president, gold ores.
Hall, W. E., superintendent, silver ores.
Halsey, A., secretary, ores and fertilizers.
Hamlin, Dr. Aug. C., slate, mineral gems.
Harts Mine, gold ore.
Hayward, Alvinza, gold ores.
Highland Mining Co., gold.
Homestake Mining Co., gold ore.
Hubbel, E. G., copper ore.
Idaho Quartz Mining Co., gold ore.

COLLECTIVE EXHIBITION, ETC.—*Cont'd.*

Kunz, George F., minerals.
Lady of the Hills Claim, antimony ore.
Lake, Richard C., antimony ore.
Lay, William L., copper and silver.
Lexington Mine, silver.
Lincoln Bessemer Co., magnetic iron ore.
Lindley, Abel, gold ores.
Longmaid, J. Henry, gold ore.
Marsh & Co., gypsum.
Marshall, Thomas P., iron ore.
Merrill, Miles J., graphite.
Mexican Phosphate and Sulphur Co., fertilizers.
Mica Properties, mica.
Mitchell, Vance & Co., Columbia semi-bituminous coal.
Montana Co., Limited, gold and silver.
Murphy, Fred. W., gold ores.
New Jersey Zinc and Iron Mining Co., zinc ores.
Newhall & Co., agents, borax, ores, etc.
New York and Georgia Manganese and Iron Co., manganese.
North Star Mining Co., gold.
Ontario Silver Mining Co., silver.
Oregon Iron and Steel Co., iron ores.
Oregon Nickel Mines Co., nickel ore.
Original Empire Mills and Mining Co., gold.
Oro Bella Mining Co., gold.
Plymouth Mine, gold.
Price, Prof. Thomas, ores and minerals.
Puget Sound Iron Co., charcoal iron.
Quijoatoas Mines, minerals.
Randol, J. B., president, quicksilver.
Reed, Simeon G., silver lead ores.
Rueger Charles C., superintendent, silver.
Senator Mine, auriferous pyrites.
Silver King Mining Co., silver.
Tuttletown Claim, gold.
Walker, J. R., uintahite.
West Virginia Central Railway Co., bituminous coal.
Williams, copper ores.

COMET MINING CO., Frisco, Beaver County, Utah. (8471.)

Copper and silver ores.

Catalogue of exhibitors—Class 41.

COMFORT CONSOLIDATED MINING CO., T. H. Wheeler, president, New York.
Gold and silver ore from Rocky Bar, Idaho.

CONGRESS MINING CO., Frederick W. Murphy, superintendent, Prescott, Ariz.
Gold-bearing pyrites ore.

CONROY, C. C., & COMFORT, S., Van Buren, Ohio.
Photograph, taken at night, of the burning gas from the Conroy & Johnson well.
Photograph of the burning gas issuing from the Karg gas-well, Findlay, Ohio.

COOSAW MINES, Coosaw River, South Carolina.
River phosphate rock.

COPPER BASIN MINING CO., Copper Basin, Prescott, Yavapai County, Ariz.
Specimens of copper ores, malachite, and blue carbonate of copper in sandstone and conglomerate.

CORBIN, P. & F., New Britain, Conn. (845.)
Locks and builders' hardware. Post-office system.

COWLES ELECTRIC SMELTING AND ALUMINUM CO., Lockport, N. Y., Dr. Leonard Walde, manager.
Series of specimens of corundum and of aluminum alloys, silicon bronze,

DELHI MINE, A. Hayward, contributor, Nevada County, Cal.
Gold-bearing quartz.

DICKERSON SUCKASUNNY MINING CO. Frederick A. Canfield, Dover, N. J.
Magnetic iron ore, Dickerson Mine, Terro Monte, Morris County, N. J.

DRAKE CO., James H. Drake, president, Sioux Falls, S. Dak.
Building and ornamental stone, including a quartzite known as Sioux Falls "jasper granite."

DRUM LUMMON MINE, J. E. Clayton, collector, Marysville, Mont.
Gold and silver ores.

EIGHTY-SIX MINE, Lynx Creek, Ariz.
Silver ore, assay value $100.

ENTERPRISE MANUFACTURING CO., OF PENNSYLVANIA, Philadelphia, Pa. (308.)
Hardware specialties.

FRANK, F. A., & Co., 316 East Eighty-second street, New York. (308.)
Hardware.

FOOTE, A. E., 1223 Belmont avenue, Philadelphia, Pa. (195.)
Minerals of the United States; educational collections illustrating the science of mineralogy.

HALL, W. E.
Silver ores.

IDAHO QUARTZ MINING CO., Grass Valley County, Cal.
Gold-bearing quartz.

INTERNATIONAL SPECIALTY CO., Buffalo, N. Y. (632.)
Perfected automatic twine-holder.

JEWETT, THE JOHN C., MANUFACTURING CO., North Division street, Buffalo, N. Y. (395.)
Labrador refrigerator and New Era water cooler.

KNAPP, J. D. C., Minneapolis, Minn. (468.)
Vaporizers for vaporization and inhalation of medicines.

KNOWD, JOHN J., Twenty-fifth and South streets, Philadelphia, Pa. (724.)
Steel shoes for horses.

KUNZ, GEORGE F., Hoboken, N. J. (740.)
Large crystals of fluor spar from St. Lawrence County, N. Y. Gadolinite, 11-pound crystal, from near Bluffton, Llano County, Tex.

LAWRENCE, R. F., & CO., 196 Pearl street, Buffalo, N. Y. (485.)
Bouquet-holders.

LINCOLN BESSEMER CO., Thomas P. Marshall, secretary, Trenton, N. J.
Magnetic iron ore from Oxford Township, Warren County, N. J.

MAINE RED GRANITE CO., Red Beach, Calais, Me. (172.)
Polished red granite urn, red granite base with rough sides, top and molding fine cut.

MARIS MACHINE CO., 146 Broad street, Philadelphia, Pa. (467.)
Portable hoists.

MARSH & CO., H. German, superintendent, Gypsum, Ottawa County, Ohio.
Gypsum, first, second, and third qualities.

MARSHALL, T. P., Trenton, N. J.
Magnetite iron ore, Bessemer ore, Warren County, N. J.

MAGNOLIA ANTI-FRICTION METAL CO., 74 Courtland street, New York. (856.)
Metallic alloys, anti-friction metal, etc.

MAGNOLIA MINES, Ashley River, South Carolina, C. C. Pinckney.
Land phosphate rock.

MERRILL, M. J., Nashua, N. H.
Graphite from Nelson, N. H.

MILLER LOCK CO., M. Jackson, managing director, Frankford, Philadelphia, Pa. (394.)
Samples of boxes, keyless locks, and padlocks.

MITCHELL, LAZAR & CO., Philadelphia, Pa. (627.)
Samples of Columbia semi-bituminous coals.

MOORE'S, JOHN, SON, 193 Front street, New York, N. Y. (217.)
Hay and manure forks, steel hoes and rakes.

MT. MICA CO., AND A. C. HAMLIN, president, Bangor, Me.
Tourmaline gems; a series of cut stones illustrating the various colors of the tourmalines of Mt. Mica, Maine.

STATE OF NEVADA. (888.)
Collective exhibit, ores and minerals.

NEW ENGLAND BROWN STONE CO., Cromwell, Conn.
Connecticut brown sandstone.

NEWHALL, H. M., & CO., San Francisco, Cal.
Cinnabar—"Float ore," cinnabar in silicious gangue, Bradford Mine, Napa County, Cal., specimens of borax.

NEW JERSEY ZINC AND IRON CO., Benjamin G. Clarke, president, 52 Wall street, New York.
Ores of zinc and zinc oxide from the company mines, Sussex County, N. J.

NEW YORK AND GEORGIA MANGANESE AND IRON CO., 37 Broad street, New York, N. Y.
New Almaden manganese ore, called "kidney manganese," from near Cartersville, Ga.

NORTH STAR GOLD MINING CO., James D. Hague, president, Grass Valley, Nevada County, Cal.
Free gold and auriferous pyrites in quartz.

NUTRIZIO, HENRY, Beekman and William streets, New York, N. Y. (93.)
Coffee pots.

OH JOE MINE, White Pine County, Nev., Hon. Thomas Wren and Jos. Grandelmyer.
Lead, copper, silver and gold ore.

Catalogue of exhibitors—Class 41.

ONTARIO MINING CO., R. C. Chambers, superintendent, Park City, Summit County, Utah.
Silver, gold, and lead ores from the different levels of the Ontario Mine.

OREGON IRON AND STEEL CO., S. G. Reed, president, Oswego, Oregon.
Samples of hot blast charcoal pig iron, iron ores, fuel and flux.

ORIGINAL EMPIRE MILL AND MINING CO., James D. Hague, president, Grass Valley, Nevada County, Cal.
Auriferous quartz from the Empire Mine.

ORO BELLA MINING CO., Bayard, Yavapai County, Ariz.
Gold-bearing quartz and sulphurets.

PECK, A. G., & CO., Cohoes, N. Y. (484.)
Samples of axes and edge tools.

PHILADELPHIA NOVELTY MANUFACTURING CO., Philadelphia, Pa. (328.)
Gas burners and gas fixtures.

PLYMOUTH MINE, A. Hayward, contributor, Amador County, Cal.
Gold-bearing quartz.

PRICE, Prof. THOMAS, San Francisco, Cal.
Gold ore from the Great Blue Lode, and other minerals.

SHEPARD, SIDNEY, & CO., 145 to 149 Seneca street, Buffalo, N. Y. (309.)
Stove-pipe damper, flour sifter, steam egg poacher, mincing knife.

SILVER KING MINING CO., Pinal County, Ariz.
Silver ores and concentrates.

SIRRET SCALE CO., Cuyahoga Falls, Ohio. (531.)
The Sirret scale.

SMITH, JOHN E., & SONS, 50 Broadway, Buffalo, N. Y. (438.)
Meat cutters, chopper, and sausage-stuffing machine.

SOCIÉTÉ ANONYME DES MINES DE LEXINGTON, Butte, Mont., Charles C. Rueger, superintendent.
Silver ore, Lexington Mine.

STANDARD TARGET CO., 121 Superior street, Cleveland, Ohio. (303.)
Set of target traps and cases of targets.

STANLEY RULE AND LEVEL CO., New Britain, Conn. (151.)
Iron and wood bench-planes and other tools.

STONEWALL CLAIM, Lindley Abel, owner, Bayard, Ariz.
Gold ore, small vein.

TIFFANY & CO., Union square, New York, N. Y. (879.)
Precious and ornamental stones of

[redacted]

WEST VIRGINIA CENTRAL RAILWAY CO., G. W. Harrison, general traffic agent, Piedmont, W. Va.
Bituminous coal from the Eck Garden Mines (14-foot vein) and from the Davis Mine (11-foot vein).

WHITE, L. & I. J., 310 Exchange street, Buffalo, N. Y. (439.)
Edge tools and machine knives.

YALE AND TOWNE MANUFACTURING CO., Schuyler Merritt, general manager, Stamford, Conn. (397.)
Specimens of hardware and locks; the Yale and Towne post-office system.

CLASS 42.—PRODUCTS OF FOREST GROWTH AND FOREST INDUSTRIES.

ACME MANUFACTURING CO., Wilmington, N. C.
Specimens illustrating the preparation and manufacture of pine bagging, etc., from the needles of *Pinus australis*.

BROOKS, HENRY, Boston, Mass.
Photographs of forest trees.

CALIFORNIA REDWOOD LUMBER ASSOCIATION, T. Korbel, agent, San Francisco, Cal.
Redwood lumber. (*See* Korbel.)

CORDLEY & HAYES, 37 Barclay street, New York, N. Y. (7.)
Indurated fiber ware, kitchen utensils, etc.

DEPARTMENT OF AGRICULTURE, Washington, D. C.
Specimens of peculiarities of forest trees; slabs of wood of special dimensions; panels of curly and figured woods; panels of furniture woods.

FAIRWEATHER & LADOW, New York, N. Y.
Slab of hemlock bark, 8 by 12 feet, framed.

FERNOW, B. E., Chief of Forestry Division, Department of Agriculture, Washington, D. C.
Maps showing the genera, species, and distribution of forest growth in North America; wood sections and herbarium specimens, representing the economically important timber trees of the United States; wall map of woodland area in the United States; tree seeds; model of tree-planting machine.

HASKIN, SAMUEL E., New York, N. Y.
Vulcanized wood and lumber.

HOUGH, ROMEYN B., Lowville, N. Y.
Veneer sections, radial, tangential, and transverse, showing the anatomy and structure of trees; veneer sections for ornamental purposes.

HURLBURT BROTHERS, 539 Brannan street, San Francisco, Cal.
California redwood.

JACKSON, A. C., Sanford, Fla. (456.)
Florida woods.

KING, Miss JULIET, Washington, D. C.
Autumn leaves. Design showing tints of autumn foliage in North American forests.

KORBEL, F., & BROTHERS, 27 Bryant street, San Francisco, Cal. (820.)
California redwood lumber and doors.

LE LONG, B. F., California.
Trunk (section) of oldest tree in California.

LINCOLN MILL CO., Eureka, Cal.
California wood.

MASSACHUSETTS SOCIETY FOR THE PROMOTION OF AGRICULTURE, Boston, Mass.
"Michaux' Sylva;" being 240 colored plates representing the forest flora of the United States, as described by André F. Michaux, father and son.

NORTHERN PACIFIC RAILROAD CO., 35 Wall street, New York, N. Y.
Sections of the trunks of forest trees.

RICHMOND CEDAR WORKS, 100 Reade street, New York, N. Y. (112.)
Wooden ware: white and red cedar ware.

ROTHROCK, J. P., professor of biology, University of Pennsylvania, Philadelphia, Pa.
Bromide enlargements of photographs of characteristic forest trees from the Atlantic region.

SARGENT, CHARLES S., director of the Arnold Arboretum, Jamaica Plain, Mass.
Sections of trees.

SEATCO MANUFACTURING CO., Seatco, Washington. (444.)
Samples, useful and ornamental, of Pacific Coast woods; samples of exterior and interior house finishing in woods.

Catalogue of exhibitors—Class 43.

SMILLIE, THOMAS W., National Museum, Washington, D. C.
Photomicrographs of woods, in radial, transverse, and tangential sections.

SPURR, CHAS. W., Co., Boston, Mass.
Veneer sections showing the anatomy and structure of woods—radial, tangential, and transverse cuts.

TABER, J. W., San Francisco, Cal.
Photographs, framed (20 and 24 inch), of characteristic California trees.

TIFFANY CHEMICAL CO., New York, N. Y. (378).
Samples of tan bark and tan extracts.

ZABRISKIE, Z. L., Hattrish, N. Y.
Sections of wood for the microscope.

CLASS 43.—PRODUCTS OF HUNTING, PRODUCTS OF FISHERIES, APPARATUS AND INSTRUMENTS FOR FISHING AND FOR GATHERING FRUITS OF NATURAL GROWTH.

DAVIDSON, H. E., 45 boulevard de Latour-Maubourg, Paris. (874.)
Fishes from British Channel mounted according to the method devised by Dr. Davidson, of Boston, and patented under the title, "Davidson's Ichthytaxidermy."

MILLS, WILLIAM, & SON, New York City.
Fishing-rod for tarpon.

NEWLAND, HENRY A., & Co., Detroit.

UNITED STATES GOVERNMENT.
Collective exhibit of the animal and vegetable fibers of the United States, illustrating the agricultural, commercial, and manufacturing aspects of the textile industry; prepared by Charles Richards Dodge, special agent, Department of Agriculture.

CLASS 44.—AGRICULTURAL PRODUCTS NOT USED FOR FOOD.

ALEXANDER DRUG AND SEED CO., Augusta, Ga.
Samples of cotton seed.

ALLEN & GINTER, Richmond, Va. (117.)
Cigarettes, smoking tobacco, and specimens of leaf-tobacco.

ARMISTEAD, L. L., Lynchburgh, Va.
Smoking tobacco, "Occidental" and "Highlander." Tobacco leaves from Virginia.

BINFORD, JAMES R., Duck Hill, Miss.
Samples of cotton seed, oil meal, and oil cake.

BOYCE, S. S., 280 Broadway, New York.
Hemp and flax, illustrating the manufacture from dry fiber.

BOYCE FIBER CO., 280 Broadway, New York.
Flax and hemp treated without chemicals and without rolling.

BROWN'S, WALTER, SON & CO., 29 High street, Boston, Mass.

COLLECTIVE EXHIBITION, ETC.—*Cont'd.*
Thornton, Noble & Davis, Richmond, Va.
Vaughn & Sarvay, Richmond, Va.
Edmondson, H. A., South Boston, Va.
Ferrill, P. W., Danville, Va.
Haas, L. B., Hartford, Conn.
Bailey, S. M., Amherst County, Va.
Noblin & Hudson, South Boston, Va.
Florida Tobacco Producing Company.
Crawford, E. M., & Son.
Hall, Thomas, New York.
Maryland Leaf Tobacco Association.
Risque, J., Campbell County, Va.
Scott, A. W., Bedford County, Va.

COLLECTIVE EXHIBITION of hay and grasses, prepared under the direction of the U. S. Department of Agriculture by Dr. George Vasey, botanist.
Contributors:
Charles, C. B., Bangor, Mich.
Brewer, Nixon, Washington, D. C.
Patterson, Fort Worth, Tex.
Speth, Richard, Augusta, Ga.
Hogan, H. H., Ennis, Tex.
Warren, W. H., Augusta, Ga.
Beal, W. J., Agricultural College, Mich.
Cox, J. W., Woodville, Ga.
Kern, H. H., Bonner Springs, Kan.
Mattox, Dr. L. C., Homerule, Ga.
Crozier, A. A., Ames, Iowa.
Williams & Rickerson, New York, N. Y.
Hudson, H. E., Hudsonville, Mich.
Ingersoll, C. L., Fort Collins, Colo.
Orcutt, C. R., San Diego, Cal.
Tracey, S. M., Agricultural College, Miss.
Lightfoot, I. L., Eutaw, Ala.
Miller, James F., Gonzales, Tex.

COLLECTIVE EXHIBIT OF THE STATE OF FLORIDA.
Raw cotton and various agricultural products.

COTTON-SEED OIL PRODUCT CO., 80 Beaver street, New York.
Cotton-seed oil lard, goddene, toilet and laundry soaps. (*See also* Class 45.)

DEPARTMENT OF AGRICULTURE, Washington, D. C.
Series of samples of lint cotton, cotton-seed, and vegetable fibers; ninety specimens of American wool in glass jars. (*See also* Collective Exhibition.)

DUTTON, H. F., & Co., Gainesville, Fla.
Sea island cotton in bale, and samples and seed.

FREMERY, FELIX, Yorktown, Tex.
Samples of native-grown jute, ramie, and ramie seed.

HAWKINS, W. B., Lexington, Ky.
Hemp seed, bundle hemp stalks, hemp "shive" or waste.

HINSON, W. Q., James Island, S. C.
Bale of improved sea island cotton.

JONES, J. T., Hogansville, Troup County Ga.
Small upright glass case showing cotton plants as ready for pickers.

JACKSON, ARTHUR C., Sanford, Fla. (456.)
Long-staple sea island cotton, etc.

JUSTICE, BATEMAN & Co., 122 South Front street, Philadelphia, Pa.
Series of commercially graded wools.

KELLOGG & MACDOUGALL, Buffalo, N. Y.
Brooms and linseed-oil cake.

KIMBALL, WILLIAM S., & Co., Rochester, N. Y. (317.)
Cigars and fine smoking tobaccos.

LEITNER, H. D., Richmond, Va.
Yucca fiber and dried leaves from which it is prepared.

LOUGHBRIDGE, Prof. R. H., University of South Carolina.
Forty-four varieties of cotton grown on the experiment farm, showing proportion of seed to lint.

LYNCH, JAMES, 194 Church street, New York, N. Y.
Series of commercially graded wools.

MACNAUGHTAN'S, W., SONS., 170 South Fifth avenue, New York.
Series of commercially graded wools.

MARTINEZ, YBOR & Co., Ybor City, Fla.
Cigars.

NEW ORLEANS COTTON EXCHANGE, New Orleans, La.
Official grades of American cotton.

NYE, WM., New Bedford, Mass. (870.)
Oils.

PEAVEY & Co., Minneapolis, Minn.
Miscellaneous specimens of flax.

PORTER & MACRAE, Memphis, Tenn.
Bale of cotton.

ROBERTS, Dr. R. R., 433 Third street, Washington, D. C.
American flax and hemp prepared by the Roberts bleaching process.

Catalogue of exhibitors—Class 45.

SIOUX CITY LINSEED OIL WORKS, Sioux City, Iowa.
Linseed oil, meal, and cake.

SMITH, J. T., Heron Lake, Minn.
One bale of tow.

SOUTHERN COTTON OIL CO., 80 Broad street, New York.
Samples of refined cotton-seed oil. (*See* Class 69.)

SPARKS, E. R., HEMP CO., Lexington, Ky.
Cleaned, dressed, and double-dressed hemp and tow.

STATISTICAL DIVISION, DEPARTMENT OF AGRICULTURE, Washington, D. C.
Series of samples of cotton in seed, grown and contributed by statistical correspondents.

STRAITON & STORM, 206 East Twenty-seventh street, New York, N. Y. (3.)
Cigars and tobacco.

STUBBS, Prof. W. C., State Experiment Station, Baton Rouge, La.
Series of small samples of cotton in seed.

TUCKER, CARTER & CO., New York City.
Kentucky hemp and cordage made from it.

WINFREE ADAMS & LLOYD, Lynchburgh, Va.
Tobacco: "Arkansas Traveller," "Mississippi Jawger," and "Adams' Fancy."

CLASS 45.—CHEMICAL AND PHARMACEU-

BURNHAM, Dr. E. S., 390 Main street, Buffalo, N. Y. (451.)
Medicated and electric batteries.

BURROUGHS, WELLCOME & CO., 82 Fulton street, New York, N. Y.
Hazeline, a preparation of Witch Hazel.

CAHIL, M. S., & CO., 94 Lincoln street, Boston, Mass. (589.)
Alma polish. Liquid shoe dressing.

CHESEBROUGH MANUFACTURING CO., 21 State street, New York, N. Y. (54.)
Vaseline and its preparations.

CLARK AND WISE CO., 39 River street, Chicago, Ill. (428.)
Wise axle grease.

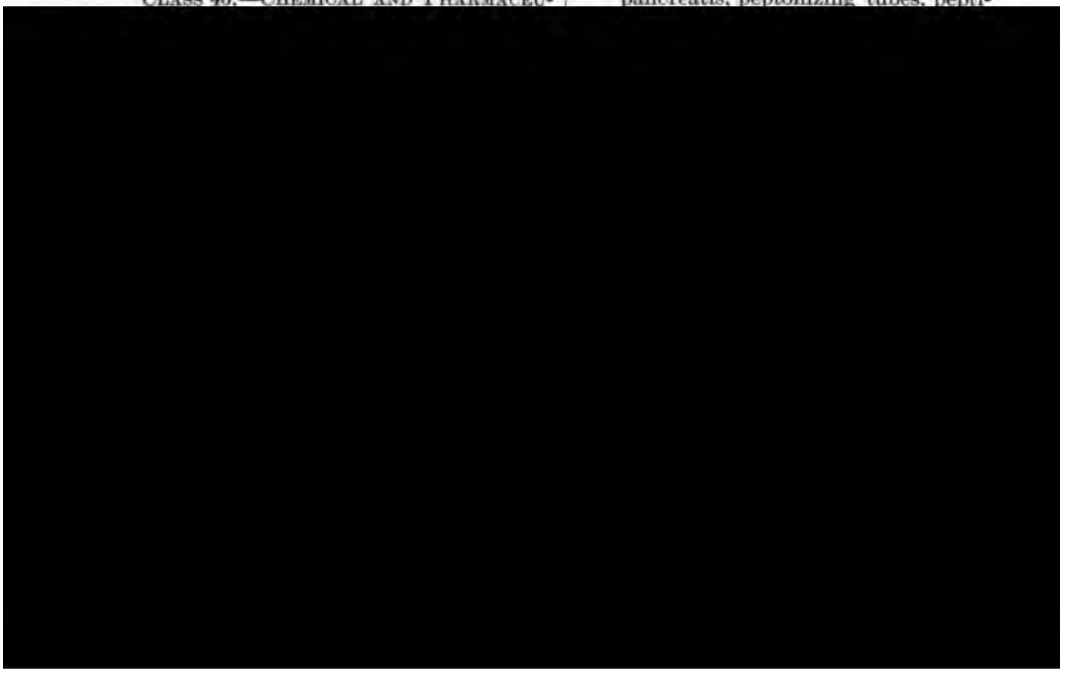
COLLINS, S., SON & CO., 32 Frankfort street, New York, N. Y. (194.)
Printing inks.

COTTON-SEED OIL PRODUCT CO., 80 Beaver street, New York.
Copco toilet soap, copco laundry and bath soap. (*See also* Class 69.)

CRANE, THE FREDERICK, CHEMICAL CO., Short Hills, N. J. (547.)
Varnishes, lacquers, etc.

DEVOE, F. W., & CO., 101 Fulton street, New York, N. Y. (207.)
Railway varnishes, paints, brushes, etc.

FAIRCHILD BROTHERS & FOSTER, 82 Fulton street, New York, N. Y. (594.)
Digestive ferments, pepsine, extractum pancreatis, peptonizing tubes, pepti-



REVERE RUBBER Co., Henry C. Morse, treasurer, Boston, Mass. (163.)
Rubber goods for mechanical purposes.

RUSSIA CEMENT Co., R. Brooks, president, Gloucester, Mass. (296.)
Liquid fish glues. Articles of manufacture representing the special industrial applications of fish glues and fish tankage.

SEABURY & JOHNSON, New York and London. (329.)
Hydronaphtol, etc.

SPHINCTER GRIP ARMORED HOSE Co., 25 Murray street, New York, N. Y. (867.)
Armored hose.

SOLWAY PROCESS, Syracuse, N. Y. (767.)
Samples of soda.

UPTON, GEORGE, 239 Franklin street, Boston, Mass. (613.)
Gelatine, glue, liquid fish glue, flint paper, and brewers' isinglass.

VALENTINE & Co., George F. Swain, treasurer, 245 Broadway, New York, N. Y. (47.)
Varnishes and paints for carriage work.

WARD, EVERETT, 6 Harrison street, New York, N. Y. (652.)
White and yellow soaps (borax) and soap powder.

WARNER, WILLIAM R., & Co., Philadelphia, Pa. (20.)
Soluble coated pills, granules, and parvules.
Granular effervescent salts and pharmaceutical preparations.

WATERBURY RUBBER Co., George A. Howe, treasurer, 49 Warren street, New York, N. Y. (235.)
Elastic tubes, hose, with steel fittings.

CLASS 46.—CHEMICAL METHODS OF BLEACHING, DYEING, PRINTING, AND FINISHING.

BANCROFT, JOHN, & BLOEDE, VICTOR G., Rockford, near Wilmington, Del. (237.)
Cotton window Hollands and fringes.

BAXTER, RICHARD, Hotel Bellevue, 39 Avenue de l'Opéra, Paris, France. (203.)
Mothaline cloth and mothaline cloth pockets.

BURROUGHS, WELLCOME & Co., 82 Fulton street, New York. (829.)
Hazeline; a preparation of witch hazel.

GARNER & Co., 2 Worth street, New York, N. Y. (318.)
Printed cotton fabrics.

WIGGINS', H. B., SONS, 124 Clinton place, New York, N. Y. (747.)
Fabric for window shades, book covers, etc.

CLASS 47.—LEATHER AND SKINS.

BURK BROTHERS, Philadelphia, Pa. (863.)
Kid skins.

BARNET, J. S., & BROTHER, 27 Spruce street, New York, N. Y. (2.)
Finished wax calf-skins.

BENZ, DIETSCH & BETZ, Newark, N. J. (814.)
Domestic glazed kid, kangaroo, and goat leathers.

BLANCHARD BROTHERS & LANE, Newark, N. J. (848.)
Patent leather for carriages.

RUSSEL, GEORGE H., Newburgh, Pa. (491.)
Samples of leather by a new and quick process of tanning with bark or extracts.

SALOMON, R. G., Newark, N. J. (447.)
Tanned and finished leathers.

SHARPE, CLARKE & Co., 195 Lake street, Chicago, Ill. (546.)
Sample sides of finished leather.

TIFFANY CHEMICAL Co., New York, N. Y. (378.)
Preparations for cleansing and tanning skins and hides.

WALLIN LEATHER Co., Grand Rapids, Mich. (695.)
Sole leather.

GROUP 6.—APPARATUS AND PROCESSES OF MECHANICAL INDUSTRIES, ELECTRICITY.

CLASS 48.—APPARATUS AND METHODS OF WORKING MINES AND OF METALLURGY.

BLAKE, THEODORE A., New Haven, Conn. (745.)
The Blake multiple jaw-crusher, for fine crushing.

Catalogue of exhibitors—Class 49.

COXE, ECKLEY B., Drifton, Luzerne County, Pa. (899.)
Double gyrating screen.

CYCLONE PULVERIZER CO., 115 Broadway, New York, N. Y. (833.)
Cyclone pulverizer.

INGERSOLL ROCK DRILL CO., W. L. Saunders, secretary, 10 Park Place, New York, N. Y. (402.)
Bar channeler, air compressor, rock drill, coal-cutting machine, and air receiver.

PARKER, FRANCIS W., Opera House Block, Chicago. (826.)
Mining machinery.

SPERRY, ELMER A., & CO., Chicago, Ill.
Mining machinery.

CLASS 49.—APPARATUS AND METHODS OF FARMING AND FORESTRY.

ALLEN, S. L., & CO., 127 Catharine street, Philadelphia, Pa. (80.)
Agricultural implements, seed drills, wheel hoes, cultivators, and plows.

ARMOUR & CO., Chicago, Ill. (840.)
Fertilizers: Ammoniate, dried blood, cattle tankage, hog tankage.

BATCHELLER & SONS' CO., Wallingsford, Vt. (529.)
Hay and manure forks.

BENSON, EGBERT, Raritan, N. J. (458.)

DOUGLAS, W. & B., Middletown, Conn. (83.)
Pumps, garden engines, and hydraulic rams for garden, farm, and general agricultural and horticultural use. (*See also* Class 52.)

FERNOW, E. B., Washington, D. C.
Tree-planting machine.

GLOVER & CHANDLER, Chicago, Ill.
Model of steam-logger. A machine making its own ice-road in the woods and hauling a train of sleighs loaded with logs at the same time.

GOULD'S MANUFACTURING CO., C. L. Zacharie, manager, Seneca Falls, N. Y. (618.)
Pumps, engines, rams, and hydraulic machines adapted for manual, animal, wind, water, steam, oil, gas, and electric power.

HIGGANUM MANUFACTURING CORPORATION, Higganum, Conn. (258.)
Agricultural machinery.

HUMBOLDT LUMBER MANUFACTURERS' ASSOCIATION, Eureka, Cal.
Portfolio containing 25 photographic views illustrating methods of lumbering and forest scenes in the California redwoods.

HURTUBISE, ALEXANDER, East Saginaw, Mich.

MAST, FOOS & CO., 21st street, Springfield, Ohio. (719.)
Buckeye lawn mowers.

MCCORMICK HARVESTING MACHINE CO., Chicago, Ill. (58.)
Combined steel grain harvester and self twine binding machine with bundle carrier attached, and transportation truck for same. Self rake reaping machine and two steel mowing machines.

MEXICAN PHOSPHATE AND SULPHUR CO., A. Halsey, secretary, 328 Montgomery street, San Francisco, Cal.
Superphosphate fertilizers from genuine guano or phosphates.

MOHR, CHARLES, Mobile, Ala.
Tools used in turpentine orcharding in the South.

MORLEY BROS., East Saginaw, Mich.
Tools used in logging.

OSBORNE, D. M., & CO., Auburn, N. Y. (53.)
Harvesting machinery: binder reaper and mowers.

PLANO MANUFACTURING CO., 81 West Monroe street, Chicago Ill. (90.)
Harvester binder and mower.

THAYER, J. E., San Francisco, Cal.
One redwood frame, containing 32 photographic views, illustrating methods of lumbering in California redwoods.

WARD, HENRY, Allen's Station, Ga.
Home-made horse-collar from corn husks.

WHITMAN AGRICULTURAL CO., St. Louis, Mo. (542.)
Horse lever hay straw and wool press.

WOOD, WALTER A., Hoosick Falls, N. Y. (103.)
Self-binding harvester, mowing machines, light inclosed gear reaper, hay rake.

CLASS 50.—APPARATUS AND METHODS USED IN AGRICULTURAL WORK AND FOOD INDUSTRIES.

ARMINGER, R., & SON, 7 East Lombard street, Baltimore, Md. (183.)
Refrigerators.

BLOOD BROTHERS, Lynn, Mass. (544.)
Nutmeg graters.

DEPARTMENT OF AGRICULTURE, Washington, D. C., D. E. Salmon, Chief of Bureau of Animal Industry.
Models showing construction and operation of a creamery, a silo, and a cold storage refrigerator.

ENTERPRISE MANUFACTURING CO., Columbiana, Ohio. (476.)
Feed cutters.

HEINE, AUGUST, Silver Creek, N. Y. (277.)
Milling machinery.

HOWES, SIMEON, Silver Creek, N. Y. (250.)
Milling machinery.

MAILLARD, HENRY, 114 and 118 West Twenty-fifth street, New York, N. Y. (15.)
Machines for making clear candies, bonbons, etc.

PHILLIPS, C. C., 20 South Broad street, Philadelphia, Pa. (591.)
Portable grinding burr mills.

SMITH, GEO. T., MIDDLINGS PURIFIER CO., Jackson, Mich. (105.)
Flour dressers, middlings purifier, dust collector attached to purifier.

CLASS 51.—APPARATUS USED IN CHEMISTRY, PHARMACY, AND TANNING.

BAILEY WRINGING MACHINE CO., Woonsocket, R. I. (425.)
Clothes wringers.

BENTZEN, CHARLES A., 240 West Twelfth street, New York, N. Y. (204.)
Washing machines.

DOLPH, THE A. M., CO., 40 Cortlandt street, New York, N. Y. (520.)
Laundry machines.

FRANK, F. A., & CO., 316 East Eighty-second street, New York. (308).
Machine for the preparation of powders, pomades, and extracts.

VIZET, V., New Rochelle, N. Y. (399.)
Washing machine attached to tub.

CLASS 52.—MACHINES AND APPARATUS OF GENERAL MECHANICS.

AMERICAN ELEVATOR CO., New York and Paris. (623.)
Hydraulic lift, used in the "Terrestrial Globe," Champ de Mars.

Catalogue of exhibitors—Class 52.

AMERICAN LEATHER LINK BELT CO., 72 Cliff street, New York, N.Y. (281.)

Leather link belting.

ARMINGTON & SIMS, Providence, R. I.

One 75 horse-power, high-speed steam-engine operating dynamos in Thomson-Houston exhibit.

BINGHAMTON HYDRAULIC POWER CO., A. Ward Ford, secretary, Binghamton, N. Y. (825.)

Hydraulic motor: Water motor.

BLAKE, JOHN HENRY, 29 Liberty street, Batavia, N. Y. (115.)

Marine rotary engine for launch service.

BROWN, C. H., & Co., Fitchburg, Mass.

Steam-engine, 100 horse-power.

CHICAGO RAWHIDE MANUFACTURING CO., Chicago, Ill. (908.)

Belting.

COLT'S PATENT FIRE-ARMS MANUFACTURING CO., Hartford, Conn. (157.)

Baxter engine and boiler. Disk engine.

CROSBY STEAM GAUGE AND VALVE CO., Boston, Mass. (605.)

Steam gauges, valves, and indicators.

DODGE MANUFACTURING CO., Mishawaka, Ind. (707.)

Wooden belt and rope pulleys.

DOUGLAS, W. & B., Middletown, Conn. (83.)

Pumps, hydraulic rams, and other hy-

MAST, FOOS & CO., Springfield, Ohio. (719.)

Iron turbine wind engine, Buckeye force-pump.

NORTHROP MANUFACTURING CO., 117 North Front street, Camden, N. J. (549.)

Boiler for steam tricycles.

OTIS BROTHERS & CO., W. Frank Hall, vice-president, 38 Park Row, New York, N. Y. (622.)

Gas and pumping engines, hydraulic lifts in the Eiffel Tower.

PICKERING GOVERNOR CO., Portland, Conn. (782.)

Pickering improved spring governor for steam-engines.

REED, J. VAN D., 13 Barclay street, New York, N. Y. (506.)

Circular looms, hydraulic circular woven hose, machine belting.

RIFES HYDRAULIC ENGINE MANUFACTURING CO., R. H. Woodrum, attorney, Roanoke City, Va.

Hydraulic engine: "Ram."

SCHIEREN, CHARLES A., & Co., 47 Ferry street, New York, N. Y. (282.)

Electric and perforated leather belting.

SLATER, FRANK, Fitchburg, Mass.

The Slater pantograph attached to the Brown engine.

SILVER & DEMING MANUFACTURING CO.,

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WALSH, JAMES, JR., 327 North Eighth street, Philadelphia, Pa. (780.)
Two steam-valves, one hydrant cock, and drawings of brake and grip.

WESTINGHOUSE MACHINE CO., Pittsburgh, Pa. (784.)
Westinghouse automatic engine, 25 horse-power, "Standard," furnishing power to dynamo.

WHEELOCK, JEROME, Worcester, Mass. (894.)
Wheelock engine system.

WILSON & ROAKE, 261 Front street, New York, N. Y. (319.)
Automatic gravity purifying trap and skimmer for steam-boilers.

WORTHINGTON PUMPING ENGINE CO., New York, N. Y., J. H. Harris, general manager. (479.)
Worthington high-duty pumping engine, capacity 6,000,000 gallons, at work on the Quai d'Orsay for the water supply of Exposition.
Worthington compound pressure pumps, with independent condensers, at work at foot of the Eiffel Tower of 300 meters lifting water to the top platform.
Worthington boiler feed pumps are used with the boilers of the Collet Company in the tower of 300 meters and in the section of the Argentine Republic, with boilers of the Babcock and Wilcox Company in the pumping station of the Quai d'Orsay and in the palace of machines, and also in the various installations of the electric syndicate.

CLASS 53.—MACHINE TOOLS.

AMERICAN SCREW CO., Providence, R. I. (71.)
Machines for making rolled and swaged wood screws.

AMERICAN TOOL AND MACHINE CO., Boston, Mass. (855.)
Fox screw-cutting lathe for brass finishers' use.

BLISS, E. W., & Co., Brooklyn, N. Y. (876.)
Drop hammers, presses, dies, and machinery for working sheet metals.

BROWN & SHARPE MANUFACTURING CO., Providence, R. I. (155.)
Universal milling machines, vertical chucking machines, grinding machines, cutter and reamer grinders, automatic gear cutters, screw machines, milling attachments, sample castings, etc.

CURTIS & CURTIS, Bridgeport, Conn. (236.)
Forbes patent die-stock, cutting and threading machines.

HIGLEY SAWING AND DRILLING MACHINE CO., 45 Broadway, New York, N. Y. (300.)
Machines for sawing and drilling iron and steel of all descriptions.

HOGGSON & PETTIS MANUFACTURING CO., 64 Court street, New Haven, Conn. (647.)
Sweetland lathe chuck.

HORTON & SON CO., THE E., Windsor Locks, Conn. (280.)
Chucks.

JACKSON, T., 2 John street, New York, N. Y.
Model of diamond stone-cutting saw.

MORSE TWIST DRILL AND MACHINE CO., New Bedford, Mass. (593.)
Twist drills for machinists, machine bits, solid shell and taper reamers, milling cutters, lathe chucks, etc.

SELLERS, WILLIAM, & CO. (incorporated), 1600 Hamilton street, Philadelphia, Pa. (148.)
Iron planing machines, tool grinding and shaping machines, drill grinding and pointing machine, self-adjusting injector of 1876, and the self-acting injector of 1887.

SILVER & DEMING MANUFACTURING CO., Salem, Ohio. (175.)
Hub boring machines for carriage-makers, spoke tenoning machines.

SIMONDS, GEORGE FREDERIC, Fitchburg, Mass. (629.)
Metal rolling machine.

STARRETT, L. S., Athol, Mass. (500.)
Mechanics' tools.

STERNBERGH, J. H., & SON, Third street and Buttonwood street, Reading, Pa. (398.)
Bolt-milling and screw-threading machine and screw-drivers.

Catalogue of exhibitors—Class 54.

STILES & PARKER PRESS CO., Middletown, Conn. (85.)
Drop hammers, presses, dies, and machinery for working sheet metal.

TANITE CO., Stroudsburg, Pa.
Tanite emery wheels and Tanite emery machines.

TOWER & LYON, 95 Chambers street, New York, N. Y. (631.)
Stephens' patent vises and attachments.

TRUMP BROTHERS MACHINE CO., Wilmington, Del. (777.)
Scroll saws, lathe center grinders, and chucks.

UPTON, GEORGE, Boston, Mass. (613.)
Flint paper.

WARNER & SWASEY, Cleveland, Ohio. (320.)
Brass-working machinery: Turret lathes, spindle valve milling machines, etc.

WHITON, THE D. E., MACHINE CO., New London, Conn. (77.)
Lathe chucks, gear-cutting machine, centering machine, expanding reamers.

CLASS 54.—APPLIANCES AND METHODS OF SPINNING AND ROPE-MAKING.

INTERNATIONAL WOOL IMPROVING CO., Boston, Mass. (488.)
Hodgson flush: Flume system for

FRIEDENWALD BROTHERS, Baltimore, Md. (810.)
Embroidering and lace-cutting machine.

INTERNATIONAL WOOL IMPROVING CO., Boston, Mass. (488.)
Hodgson flush: Flume system of scouring and dyeing wool; also model of same.

CLASS 56.—APPLIANCES AND METHODS OF SEWING AND MAKING ARTICLES OF CLOTHING.

BAILEY, R. S., Silver Creek, N. Y. (477.)
Apparatus for cutting out clothing.

CAMPBELL SEWING-MACHINE CO., Pawtucket, R. I.
Campbell lock-stitch sewing-machines.
Lock.

DAVIS SEWING-MACHINE CO., Watertown, N. Y. (31.)
Sewing-machines for family and manufacturing use.
Attachments and samples of sewing-machine work.

EATON, J. H., Monroe, Wis. (78.)
The new Victoria plaiter, an appliance for making dress trimming.

INTERNATIONAL BUTTON-HOLE SEWING MACHINE CO., 458 Harrison avenue,

SINGER SEWING-MACHINE CO., 34 Union square, New York, N. Y. (286.)
Sewing-machines and samples of work.

STANDARD SEWING-MACHINE CO., Atlantic avenue, Boston, Mass.
A standard button sewing-machine.

TAPLEY MACHINE CO., 234 Devonshire street, Boston, Mass. (868.)
Tapley heel burnisher.

TILLINGHAST SUPPLY CO., Providence, R. I. (831.)
Sewing-machines.

UNION BUTTON-SEWING MACHINE CO., Boston, Mass.
Union button-sewing machine for use in clothing and underwear.

WHEELER & WILSON MANUFACTURING CO., N. W. Wheeler, president, Bridgeport, Conn. (46.)
Sewing-machines for general and special purposes, including button-hole sewing-machine, with attachments and appliances.

WHITE SEWING-MACHINE CO., Thomas N. White, president, Cleveland, Ohio. (48.)
Sewing-machines.

WINGATE, JULIA. (807.)
Measurement system for dress-making.

CLASS 57.—APPLIANCES AND METHODS OF MANUFACTURE OF ARTICLES FOR FURNITURE AND DWELLINGS.

CASEY MACHINE SUPPLY CO, 113 Lewis street, New York, N. Y. (495.)
Nailing machine for making cigar-boxes and packing-boxes (self-feeding.)

CHAPMAN, LEWIS M., 82 West Eightieth street, New York, N. Y. (142.)
Process of manufacture in glass spinning, modeling and engraving.

FAY, J. A., & CO., W. H. Doane, president, Cincinnati, Ohio. (34.)
Machinery for the economic conversion of lumber for Government navy-yards and arsenals, railroad-car and locomotive shops, ships, bridge, house, carriage, and furniture construction, and every other purpose for which lumber may be fabricated: a collection of 30 machines for planing, tongueing, grooving, surfacing, thicknessing, sawing, resplitting, molding, mortising, boring, tenoning, dovetailing, and polishing.

GAYLORD, E. E., Bridgeport, Conn. (316.)
Miter cutter, miter saw, and miter plane.

GREGG, WILLIAM L., 423 Walnut street, Philadelphia, Pa. (640.)
Small working model of brick-making machine and apparatus for brick-making. Front and ornamental brick.

MACCOY, JAMES S., 431 Eleventh avenue, New York, N. Y. (143.)
A pneumatic tool in its various applications.

REID, A. H., Thirtieth and Market streets, Philadelphia, Pa. (388.)
"Lightning" braces for boring holes, driving screws, etc.

SCHWAB, ERNEST, 89 West Harrison street, Chicago, Ill. (180.)
Wood-working machinery.

SILVER & DEMING MANUFACTURING CO., Salem, Ohio. (175.)
Hub boring machines for carriage-makers, spoke tenoning machines.

CLASS 58.—APPLIANCES AND METHODS OF PAPER MANUFACTURE, COLORING AND PRINTING.

BORIE MAILING-MACHINE CO., 520 Washington street, San Francisco, Cal. (765.)
Mailing machine (hand power) for affixing postage stamps and addressing slips.

CAMPBELL PRINTING PRESS MANUFACTURING CO., John T. Hawkins, president, 160 William street, New York, N. Y. (184.)
Cylinder printing machines.

CASEY MACHINE AND SUPPLY CO., J. Casey, president, 183 Lewis street, New York, N. Y. (495.)
Double job press, belt shifter and brake.

DOUGLAS & WILSON, Cincinnati, Ohio.
Merchants' roll-paper printer and cutter.

ELECTRINE CO., St. Paul, Minn.
Inkoleum, for reducing and refining ink to prevent offset, etc.

Catalogue of exhibitors—Class 59.

GOLDING & Co., 177 Fort Hill square, Boston, Mass. (68.)
Printing presses.

HUTCHINS, STILSON, for the Mergenthaler Printing Company and the American Press Company, Washington, D. C. (545.)
The graphophone and phonograph, in connection with the Mergenthaler linotype matrix setting and type-casting machine and the Henkle-Fowler press.

KLAUDER & BROTHERS, American street and Lehigh avenue, Philadelphia, Pa. (292.)
Skein yarn dyeing machine.

LIBERTY MACHINE WORKS, 54 Frankfort street, New York, N. Y. (248.)
Liberty printing presses.

MACKELLAR, SMITHS & JORDAN Co., Philadelphia, Pa. (653.)
Printing type and combination borders.

MCCOY, M. P., 7 Water Lane, Ludgate Circus, London, England. (61.)
Model American printing office, showing American type, cases, tools, stands, cabinets, paper-cutting machines, milling machines, and six American platen printing machines.

MILLER, EDWARD L., Philadelphia, Pa. (650.)

AUTOMATIC MACHINE Co., 45 Broadway, New York, N. Y. (665.)
Automatic machines.

CLEGG, CHARLES A., 127 Broadway, New York, N. Y. (779.)
The Thompson duplicating and copying machine, for making duplicate copies of manuscript or the writing on hard or tissue paper.

CLOUGH & MACCONNEL, 132 Nassau street, New York, N. Y. (24.)
Wire corkscrew machine and full line of Clough's proprietary corkscrews.

COLUMBIA TYPE-WRITER MANUFACTURING Co., 129 Crosby street, New York, N. Y. (32.)
Bar-lock type-writer and Columbia type-writer.

HALL TYPE-WRITER Co.
Type-writers.

HAMMOND TYPE-WRITER Co., 77 Nassau street, New York, N. Y. (74.)
Hammond type-writers and drop cabinets for type-writers.

HOGGSON & PETTIS MANUFACTURING Co., 64 Court street, New Haven, Conn. (647.)
Morris type-writer; Lowdon bank punch.

LAMSON CONSOLIDATED STORE SERVICE Co., Boston, Mass.

WYCKOFF, SEAMANS & BENEDICT, 327 Broadway, New York, N. Y. (38.)
Remington Standard type-writer and accessories.

CLASS 60.—CARRIAGE-MAKING, WHEELWRIGHT'S WORK, HARNESS-MAKING AND SADDLERY.

CHAPMAN MANUFACTURING CO., Meriden, Conn. (678.)
Plumes and bells for sleighs.

DANN BROTHERS & CO., 80 Franklin street, New Haven, Conn. (382.)
Bent wood and carriage wood-work.

HEALEY & CO., Broadway, near Forty-second street, New York, N. Y. (265.)
Fine carriages.

KIMBALL, C. P., & CO., Wabash avenue and Harrison street, Chicago, Ill. (610.)
Brougham, mail phaeton, speeding wagon, and trotting sleigh.

MARTIN & MARTIN, 574 Fifth avenue, New York, N. Y.
Saddles and harness.

SHEPARD, H. G., & SONS, New Haven, Conn. (147.)
Bent carriage wood-work.

SECO, HENRI, 31 Nassau street, New York. (801.)
Improved jacks.

CLASS 61.—RAILROAD APPLIANCES.

BISHOP, MAJOR D. E., 822 Broadway, New York, N. Y. (191.)
Combination railroad joint.

BOYDEN POWER-BRAKE CO., Baltimore, Md. (746.)
Model railroad track and train equipped with Boyden power-brake.

FISHER, CLARK, Trenton, N. J.
The Fisher rail-joint mounted, as in practice, on oak ties.

FLEMING MANUFACTURING CO., Fort Wayne, Ind. (101.)
The Leader road machine.

HALSEY, JAMES T., Paterson, N. J. (901.)
Railroad machine-shop drill.

HOFFMIER, A. K., Lancaster, Pa. (769.)
Drawings showing an improved system of railway-track laying.

IRON CAR CO., 120 Broadway, New York. (900.)
Tubular iron frame freight-car, Goodfellow & Cushman's patent.

INLOES, WILLIAM H., Asheville, N. C. (27.)
Model of patent railway turn-table lock.

LAIRD, B. F., Covington, Ky. (119.)
Two cars upon trestles showing the working of his automatic car coupling.

MERCHANTS' DISPATCH TRANSPORTATION CO., John C. Noyes, general manager, 335 Broadway, New York, N. Y. (534.)
Wickes patent refrigerator car.

NEW YORK COMMERCIAL CO. (Limited), 140 Pearl street, New York, N. Y. (411.)
Equipments and supplies for the building and operating of railroads.

NEW YORK CAR-WHEEL WORKS, Buffalo, N. Y. (219.)
Samples of car-wheels and chilled test pieces and sample pig-iron.

PECKHAM STREET-CAR WHEEL AND AXLE CO., George L. Fowler, secretary, 239 Broadway, New York, N. Y. (259.)
Street-car wheels, steel tired paper car-wheels, steel tired car-wheels, and car-axles.

PENNSYLVANIA RAILROAD CO., Altoona, Pa. (662.)
Passenger-car truck, freight-car truck, section of passenger car, section of box car, section of gondola car, cast-iron wheels on axle, worn-out wheel (cast iron), cast-iron wheel spoiled in casting, broken wheel showing chill, etc., and other small articles; section of standard rail and rail joint; album of specifications for materials, etc.; album of photographs of cars, locomotives, etc.

PORTER, H. K., & CO., Pittsburgh, Pa. (415.)
Light back-truck locomotive.

RAILWAY NEWS CO., 32 Cortlandt street, New York, N. Y. (787.)
Railroad appliances and models, including models of new engines, bridges, viaducts, and railroad engineering works.

Catalogue of exhibitors—Class 62.

SPRAGUE ELECTRIC RAILWAY AND MOTOR CO., 16 Broad street, New York, N. Y. (677.)
Electric railway truck mounted with two 15 horse-power motors. (*See also* Class 62.)

THOMSON-HOUSTON INTERNATIONAL ELECTRIC CO., Boston, Mass. (608.)
Electric railway appliances, motors, trucks, car complete.

WARREN, ANDREW, St. Louis, Mo. (764).
Lever lifting and lowering jacks for railroad work.

CLASS 62.—ELECTRICITY.

AMERICAN BELL TELEPHONE CO., Boston, Mass. (501.)
Telephones and telephone appliances.

AMERICAN GRAPHOPHONE CO., Washington, D. C.
Graphophones.

"C. AND C." ELECTRIC MOTOR CO., 402 Greenwich street, New York, N. Y., Arthur Shippey, agent. (859.)
Electric motor and ventilating pans.

COBB VULCANITE WIRE CO., Wilmington, Del. (405.)
Flexible vulcanized rubber, insulated wires for electric light, telegraph, and all electrical purposes, especially underground wires.

COMMERCIAL CABLE CO., Ave. de l'Opéra,

ELECTRICAL SUPPLY CO., 171 Randolph street, Chicago, Ill. (709.)
Special electrical appliances.

ELECTRON MANUFACTURING CO., THE, Brooklyn, N. Y. (878.)
Electro motors.

GRAY, ELISHA, Highland Park, Ill. (710.)
Telephones, harmonic telegraph, telautograph, speaking telephones, historical apparatus.

HANSON, VAN WINKLE & CO., Newark, N. J. (750.)
Photographs illustrating apparatus and methods of electro-metallurgy of nickle.

HEISLER ELECTRIC LIGHT CO., A. Graner, secretary, 809 South Seventh street, St. Louis, Mo. (367.)
Heisler electric-light dynamo, with automatic regulator with requisite lamps.

JEFFORDS, J. E., & CO. (903.)
Photographs of porous cells for electrical purposes.

JOHNSTON, W. J., CO. (Limited), 168 Potter Building, New York, N. Y. (716.)
Books concerning electricity published in the United States.

MUNSON LIGHTNING CONDUCTOR CO., Indianapolis, Ind. (453.)
Lightning conductors.

OZONITE CO., W. J. Candee, treasurer,

THOMSON, ELIHU, Lynn, Mass. (607.)
Various inventions pertaining to electricity.

THOMSON ELECTRIC WELDING CO., 70 Kilby street, Boston, Mass. (525.)
Electric welding apparatus.

THOMSON-HOUSTON INTERNATIONAL ELECTRIC CO., 620 Atlantic avenue, Boston, Mass. (608.) (*See also* Class 61.)
Electric generators, electric motors, and electric appliances.

UNITED STATES COMMISSIONER OF PATENTS, Washington, D. C.
Volumes of patents relating to electricity.

UNITED STATES NAVAL OBSERVATORY, Capt. R. L. Phythian, Superintendent, Washington, D. C. (824.)
Electrical distribution of time; Gardner's system by correcting and controlling clocks, dropping balls, and other signals. (*See also* Class 15.)

VOLTA GRAPHOPHONE CO., Washington, D. C. (434.)
Graphophones.

WESTERN ELECTRIC CO., M. Barton, president, Chicago, Ill. (526.)
Electrical apparatus.

WHARTON, JOSEPH, American Nickel Works, Camden, N. J. (902.)
Magnetic alloy of nickel with tungsten.

CLASS 63.—APPLIANCES AND METHODS OF CIVIL ENGINEERING, OF PUBLIC WORKS AND ARCHITECTURE.

AMERICAN ROAD-MACHINE CO., Kennett Square, Pa. (510.)
American road machine.

BUFFALO INTERNATIONAL FAIR ASSOCIATION, 47 Chapin Block, Buffalo, N. Y. (452.)
Plans of exposition building.

CORBIN, P. & F., New Britain, Conn. (845.)
Locks and builders' hardware, post-office system.

EMPIRE GRANITE CO., 625 East Fifteenth street, New York, N. Y. (294.)
Artificial granite laundry tubs.

FLEMING MANUFACTURING CO., Fort Wayne, Ind. (101.)
The Leader road machine.

GESNER, JOHN F., 15 State street, New York, N. Y. (145.)
Specimens of artificial stone and wood.

HAYES, GEORGE, 71 Eighth avenue, New York, N. Y. (127.)
Metallic fireproof lathing, furring, etc., with machinery.

HERRING & CO., 251 Broadway, New York, N. Y. (644.)
Burglar and fireproof safes.

INTERNATIONAL GAS AND FUEL CO., Chicago, Ill. (726.)
System of fluid fuel distribution, as applied to furnaces, dry kilns, etc.

KENSETT, JAMES W., 272 Federal street, Boston, Mass. (324.)
Metallic lathing and foundation therefor, for the prevention of the spread of fire.

KOCH, A. B., CO., Peoria, Ill. (682.)
Brackets for shelves in cast iron, fancy patterns.

LEHIGH VALLEY CREOSOTING CO., Perth Amboy, N. J., Walter G. Berg, superintendent.
Photograph of creosoting works.
Catalogue of small photographs of works with description of same; also photograph of tests with description.

LINDENTHAL, GUSTAV, 36 Lewis Block, Pittsburgh, Pa. (819.)
Perspective drawing of the proposed North River bridge at New York City, with middle span 2,850 feet long, for six railroad tracks.

MILLER LOCK CO., M. Jackson, managing director, Frankford, Philadelphia, Pa. (394.)
Samples of boxes, keyless locks, and padlocks.

SECO, HENRI, 31 Nassau street, New York, N. Y. (801.)
Patent improved lifting jacks for vehicles.

STANDARD PAINT CO., 59 Maiden Lane New York, N. Y. (73.)
"P and B" electrical compounds and paints, sheathing and water-proof lining papers; roofing and covering.

TUBULAR BARROW MACHINE CO., 169 to 175 Fourteenth street, Jersey City, N. J. (658.)
Tubular steel wheelbarrows for dirt, coal, ore, and mills; steel dumping tub for coal or ore.

Catalogue of exhibitors—Class 64.

TURNER, I. JACKSON, Princeton College, Princeton, N. J. (604.)
Aspirating ventilator or chimney cap.

UNITED STATES PATENT CEMENT CONDUIT CO., 48 Dey street, New York, N. Y. (800.)
Sections of continuous conduit for wires under ground.

UNITED STATES CORPS OF ENGINEERS. (909.)
Methods of civil engineering; reports on public works.

WHITEHOUSE, FREDERIC COPE, New York. (335.)
A relief map of the Raiyan and Fayoum depressions in Middle Egypt, from original surveys—with complete details of the ancient canal—the Bahr Jusut or River of Joseph, and the new Raiyan canal and reservoir.

WILSON, JAMES GODFREY, 907 Broadway, New York, N. Y. (64.)
Rolling blinds, Venetian blinds, and rolling steel shutters.

WITTE, JOHN G., & BROTHER, 75 Chambers street, New York, N. Y. (67.)
Door spring and check.

WORTHINGTON PUMPING-ENGINE CO., 145 Broadway, New York. (479.)
One Worthington compound condensing, high-duty, water-works engine, with boilers, buildings, and acces-

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CLASS 65. — NAVIGATION AND LIFE-SAVING.

ALLEN, FREDERICK S., Cuttyhunk Island, Mass. (19.)
Model of reversible life-boat.

BADIA & DUBOIS, 332 South Fourth street, Philadelphia, Pa. (238.)
Automatic life-preserver belts and model of automatic life-raft; drawing showing automatic system of inflating bags to render a vessel unsinkable.

COMMERCIAL CABLE CO., New York, N. Y. (675.)
Model of the cable-repairing steamer *The Mackay-Bennett*.

DASHIELL, BENJAMIN J., JR,, 6 South street, Baltimore, Md. (788.)
Drawings of tow-boat.

DOLLIVER, JAMES W., 5 Broad street, Boston, Mass. (541.)
Swan bicycle life-guard boat.

HOLMES, EBEN, Marion, Mass. (146.)
Model of cat-boat.

NORTON. (910.)
Yacht *Neversink*.

RAILWAY NEWS CO., 32 Cortlandt street, New York, N. Y. (787.)
Models of Long Island Sound steamer, Hudson River steamboats, ferry-boats, and transfer boats; pictures

BOARD OF TRADE, Minneapolis, Minn.
Grain, showing the different grades of quality established officially by the State.

BUTLER, A. P., Commissioner of Agriculture for South Carolina.
Rice, the raw finished product, including sixteen specimens representing the various processes of the milling.

COLLECTIVE EXHIBIT of cereals prepared under the direction of the Secretary of Agriculture, Washington, D. C.
Contributors:
Morrow, G. E., professor of agriculture, Illinois University, Champaign, Ill.
Thorne, Charles E., director agriculture experiment station, Columbus, Ohio.
Ingersoll. C. L., president State Agricultural College, Fort Collins, Col.
Foster, Luther, professor of agriculture, Brookings, Dak.
Furnas, R. W., ex-governor, Lincoln, Neb.
Whitney, C. C., Marshall, Minn.
Whitney, F. I., general passenger agent, St. Paul, M. & M. R. R., St. Paul, Minn.
Black, General J. C., Washington, D. C.
Silver, J. P., Glenville, Md.
The A. B. Cleveland Co., New York.
Bretz, J. H., Oakdale, Neb.
Gwynn, J. R., Clinton, Mo.
Henry, Professor, director agricultural experiment station, Madison, Wis.
Vanderhoof, R. H., Newton, Ill.
Haase, A. F., Dakota City, Neb.
Bessey, Prof. C. E., Lincoln, Neb.
Nelson, J. F., Olney, Ill.
Higgins, J. P., Calhoun, Ill.
Dowd, M. Fairchilds, Kansas City, Mo.
Gabilson, C. L., New Hampton, Iowa.
Nimo Bros., Emerson, Iowa.
Upton, E. M., Cummings, Dak.

GLEN COVE MANUFACTURING CO., New York, N. Y.
Samples of maizena, grape sugar and glucose.

INGERSOLL, Prof. C. L., president Agricultural College, Fort Collins, Colo.
Eight large plaques with designs formed of the various grains and grasses grown in Colorado.

JACKSON, ARTHUR C., Sanford, Fla.
Cereal products of Florida; general collection of agricultural products.

MANSFIELD, J. E., Washington, D. C.
Samples of pop-corn.

NORTHERN PACIFIC RAILROAD CO., 35 Wall street, New York, N. Y.
Various products.

PILLSBURY, C. A., & Co., Minneapolis, Minn.
Wheat in sacks representing the grades officially established; flour in its various stages of manufacture.

SCHUMACHER, T., & Co., Akron, Ohio.
Various finished cereal products.

STREET, S. H., & Co., New Haven, Conn.
Cereal products: "Johnny-cake," flour, etc.

TOWNSHEND, CHARLES HERVEY, New Haven, Conn.
"Wheatine," "whahaba," "johnny-cake," and other derivatives of wheat, corn, and buckwheat.

VOGT, AUGUST, Will's Point, Tex.
One bushel of white corn.

WILEY, Dr. H. W., Washington, D. C.
Illustrations of experiments with sorghum sugar cane.

CLASS 68.—YEASTS, ETC.

QUEEN CITY CHEMICAL CO., 77 Main street, Buffalo, N. Y.
Specimens of baking powder.

CLASS 69.—FAT SUBSTANCES USED FOR FOOD, MILK PRODUCTS, AND EGGS.

ARMOUR & CO., Chicago, Ill.
Lard.

BAGNOLI, LUIDI, San Francisco, Cal.
Olive oil.

CASSARD, G., & SON., Baltimore, Md.
Lard.

DEPARTMENT OF AGRICULTURE, Washington, D. C., D. E. Salmon, Chief of Bureau of Animal Industry.
Butter and cheese made in the United States, suitable for export.

Catalogue of exhibitors—Class 70.

DEPARTMENT OF AGRICULTURE, Washington, D. C., Dr. Thomas Taylor, microscopist.
Two hundred and seventy-three microphotographs of the crystalline structure of animal and vegetable fats.

EAGLE CONDENSED-MILK CO., 79 Murray street, New York City.
Condensed milk.

ELGIN CONDENSED-MILK CO., Elgin, Ill.
Condensed milk.

GOODRICH, E. E., Santa Clara, Cal.
Olive oil, grades of crop of 1889.

GREEN MOUNTAIN STOCK FARM, West Randolph, Vt.
Butter.

HELVETIA MILK-CONDENSED CO., Highland, Ill.
Condensed milk.

HOOPER, GEORGE F., Sonoma, Cal.
Olive oil.

KLAUBER, J. C., Philadelphia, Pa.
Samples of oil made from the germ of the maize.

MICHENER, J. H., & Co., Philadelphia, Pa.
Lard.

MORRELL & Co., Chicago, Ill.
Butter.

RIXFORD, G. P., San Francisco, Cal.
Olive oil.

SIMPSON, McINTIRE & Co., Boston, Mass.

CASSARD, G., & SON, Baltimore, Md.
Dried, salted, and smoked meats.

COWDREY, E. I., & Co., Boston, Mass.
Canned meats.

CURTICE BROS., Rochester, N. Y.
Canned meats.

FERRIS, F. A., & Co., 274 Mott street, New York, N. Y.
Dried, salted, and smoked meats.

FRANCO-AMERICAN SOUP CO., Warren street, New York, N. Y.
Canned soups.

HUCKINS, J. H. W., & Co., 18 Waterford street, Boston, Mass.
Canned soups.

HUMBERT, HENRY, & Co., 814 Fulton street, New York, N. Y.
Extracts of meat.

LIBBY & Co., Chicago, Ill.
Canned meats.

MICHENER, J. H., & Co., Philadelphia, Pa.
Dried, salted, and smoked meats.

MORRIS & Co., Chicago, Ill. (Fairbanks' Canning Co.).
Canned meats.

RICHARDSON & ROBBINS, Dover, Del.
Canned meats.

ROGERS, W. H., 419 California street, San Francisco, Cal.
Canned fresh salmon from Columbia River and Alaska.

[redacted]

DIVISION OF POMOLOGY, U. S. Department of Agriculture, Washington, D. C.
Series of models of citrus fruits and of orchard fruits; collection of dried fruits.

ERIE PRESERVING CO., Buffalo, N. Y.
Canned succotash, sweet corn, and tomatoes, fruits, and berries.

FLORIDA STATE HORTICULTURAL SOCIETY.
Citrus fruits.

GRIFFIN CANNING CO., Griffin, Ga.
Canned tomatoes.

HARRIS, JOSEPH, SEED CO., Rochester, N. Y.
Varieties of beans, peas, and beets.

HOOPER, GEORGE F., Sonoma, Cal.
Walnuts, English, grown in California; dried prunes, pickled olives.

KENNON, GRAY & CO., Sublett Taverne, Pa.
Canned tomatoes and sweet corn.

KIMBALL, FRANK A., National City, Cal.
Citrus fruits.

MALLORY, E. B., & CO., Baltimore, Md.
Canned tomatoes, corn and peas, peaches.

MARTIN, WAGNER & CO., Baltimore, Md.
Canned tomatoes, corn and peas, pineapples, peaches, apples.

MEADE, GEORGE W., & CO., San Francisco, Cal.
Dried fruits of California.

MYER, THOMAS J., & CO., Baltimore, Md.
Canned vegetables, fruits, and berries.

NUMSEN, WILLIAM, & SONS, Baltimore, Md.
Pineapples, peaches, plums, and berries, canned vegetables.

ORESTOTT, HENRY, Placer County, Cal.
One box muscatel raisins.

PACIFIC ORCHARD CANNERY, San José, Cal.
Canned fruits and fruits in brandy.

PERRY, F. H., Providence, R. I.
Canned tomatoes, asparagus, beans and corn, fruits and berries.

PLANT SYSTEM, Florida.
Preserved fruits.

RIXFORD, G. P., San Francisco, Cal.
Jujube berries, pistachio nuts.

ROGERS, W. H., 419 California street, San Francisco, Cal.
Canned fresh fruits: Apricots, peaches, etc.

ROSA, JOHN J., Milford, Del.
Dried peaches, etc.

SEARS & NICHOLS, Chillicothe, Ohio.
Twelve cans of corn, canned peaches.

SEED DIVISION, U. S. Department of Agriculture, Washington, D. C.
Miscellaneous varieties of garden seeds.

STEINER, SAMUEL, San Francisco, Cal.
Dried fruits.

VAN DIEMEN, M. H., Washington, D. C.
Collection of fruits.

VAN NOSTRAND & CO., New York City.
Evaporated apples and dried fruits.

WINTERPORT PACKING C., Winterport, Me.
Canned sweet corn.

CLASS 72.—CONDIMENTS AND STIMULANTS; SUGAR AND PRODUCTS OF CONFECTIONERY.

ADAMS & SONS, 156 Sands street, Brooklyn, N.Y.
Adams' tutti frutti chewing-gum.

BACON, Mrs. C. A., Ormond, Fla.
Guava jelly and preserves.

COLLECTIVE EXHIBIT prepared under the direction of the Secretary of Agriculture, Washington, D. C., Dr. H. W. Wiley, chemist.
Sorghum syrup, sorghum heads of different varieties showing the development of the plant; sorghum sugar refined, etc.

CONVENT OF ST. AUGUSTINE, St. Augustine, Fla.
Fruit preserves.

CONWAY SPRINGS CO., Conway Springs, Kan.
Sorghum sugar refined.

DADANT, CHARLES, & SON, Hamilton, Ill. (*See also* Class 76.)

DOUGLAS SUGAR CO., Douglas, Kan.
Sorghum syrup, sorghum sugar refined.

ERIE PRESERVING CO., Buffalo, N. Y.
Conserves.

FAWCETT, ALICE K., Ormond, Fla.
Guava jelly.

HEINZ, H. J., CO., Pittsburgh, Pa.
Apple butter, raspberry jam.

Catalogue of exhibitors—Class 73.

KINNEY, S. H., Morristown, Minn.
Sorghum syrup, sorghum heads of the "Early Amber" variety cultivated at the forty-third degree of latitude; sorghum sugar refined.

LUTTED, JAMES, 27 and 29 Ellicott street, Buffalo, N. Y.
Specimens of candies and confectionery made by hand and steam power.

MAILLARD, HENRY, West Twenty-fourth, West Twenty-fifth streets and Broadway, New York, N. Y.
About 3,000 different styles of bonbons and fancy chocolates; two chocolate vases, height, 1.45^{mm}; weight, 450 kilograms. (*See also* Class 11.)

MILLER, GEORGE, & SON, 610 Market street, Philadelphia, Pa.
Confectionery, American candies.

NEWCOMB, T.
Candies.

PALISADE MANUFACTURING CO., West Hoboken, N. J.
Tournade's kitchen bouquet, concentrated essence for flavoring soups, gravies, etc.

PRESERVING AND CANNING CO., THE, St. Augustine, Fla.
Preserved guava, guava jelly, marmalade, and preserved figs.

ROSS, MARY E., 104 Pearl street, New York, N. Y.
Excelsior sauce.

BERGNER & ENGEL BREWING CO., Philadelphia, Pa.
Malt liquors.

BERINGER BROTHERS, St. Helena, Napa County, Cal.
Wines and brandies.

BOLEN & BYRNE, 416 to 423 East Fifty-fourth street, New York.
Golden Russet champagne cider, mineral waters, ginger ale, and other aerated beverages.

BRUN, A., & CO., Nouveau Medoc, Oakville, Napa County, Cal.
Wines: Riesling, Catawba, Carignane, Zinfandel.

CALIFORNIA STATE VITICULTURAL COMMISSION "EXPERIMENTAL CELLAR," San Francisco, Cal.
Five cases assorted wines of California, various brands and vintages.

CHAUCHÉ, A. G., Mont Rouge Vineyards, Livermore, Alameda County, Cal.
Wine from a blend of Sauvignon Blanc, Semillon and Muscatel de Bordelais.

CRABB, H. W., Tokalon Vineyard, Oakville, Napa County, Cal.
Three cases wine, assorted, Sauterne, Tokay, Gutedel, Muscatel, Chambertin, etc.

CRAFT, N. W., Shore, N. C.
Wine.

CRAIG, W. O., Sonoma, Cal.

GAST WINE Co., St. Louis, Mo.
Wines: Norton, Taylor, Iowa, Riesling, etc.

GREENBAUM, ALFRED, San Francisco, Cal.
Three cases wine, assorted, from vineyards in a mountainous region.

GUNDLACH, J., & Co., San Francisco, Cal.
Ten cases assorted wines from their Rhinefarm, Sonoma, vineyards.

GROSSMAN, H., Napa, Cal.
Wines and brandies.

HAGEN, HENRY, Cedar Knoll vineyards, Napa County, Cal.
Wines and brandy: Reisling, Zinfandel, Port Angelica, Malaga, etc.

HARASZTHY, ARPAD & Co., San Franciso, Cal.
Eclipse extra dry, Eclipse brut, Reisling, Gutedel, Zinfandel, etc., mostly from Orleans vineyards, Yolo County.

HILGARD, Prof. W. E., University of California, Berkeley, contributor.
Condensed must samples.

HOOPER, GEORGE F., Sobre Vista vineyard, Sonoma, Cal.
Wines: Reisling, Zinfandel, Muscatel, and brandy.

HUME & Co., 807 Market Space, Pennsylvania avenue, Washington, D. C.
Old Stag whiskey and old apple brandy.

HUSMAN, Prof. GEORGE, Napa City, Cal.
Wines of California.

KRUG, CHARLES, St. Helena, Napa County, Cal.
Case of wines, assorted, including Mondense, Sweet Muscatel, and brandy.

KOHLER & FROHLING, San Francisco, Cal.
Eight cases wine and brandy, assorted, from their Glen Ellen vineyards.

KUNZ, JOSEPH, New York City.
Beer.

MATTHEWS, J., Lisbon Winery, Napa, Cal.
Case of selected wines: Riesling, Zinfandel, sherry,

MEGLIAVALLA, G., Napa, Cal.
Claret wine made in Napa Valley.

MONTGOMERY BREWING Co., Montgomery, Ala.
Beer.

MONTICELLO WINE Co., Charlottesville, Va.
Wines: Cythiana, Norton, Clinton, Ives, etc.

MOTT, S. R. & T. C., 118 Warren street, New York, N. Y.
Sweet and Golden Russet carbonated cider.

MUNSON, J. V., Denison, Tex.
Collection of native vines.

NAPA VALLEY WINE Co., cellars at Napa, commercial business at San Francisco, Cal.
Five cases wines: Carignane, Burgundy, Cabinet Sauvignon, Gutudel, Tokay, and brandy.

NEW URBANA WINE Co., Hammondsport, N. Y.
Gold Seal, Port, sweet and dry Catawba, etc.

NOUVEAU CLOS VOUGEOT VINEYARD, V. Courtois, manager, St. Helena, Fapa County, Cal.
Three cases wines, assorted brands and vintages.

OSBORN, JOHN, SON & Co., New York, Philadelphia, Montreal.
"Antediluvian" pure rye whiskey.

PEARSON, ALEX. M., Vineland, N. J.
Burgundy and Ironclad.

PLEASANT VALLEY WINE Co., Rheims, Steuben county, N. Y.
Western extra dry, Delaware, Catawba.

PURITY WINE Co., San Francisco, Cal.
Red and white wines treated by an electric process.

RUSSOW, ADOLPH, Proffits P. O., Va.
Wine, "Norton."

RYCKMAN, G. F., Brocton Wine Company, Brocton, N. Y.
Imperial champagne, Brocton Port, Catawba, Niagara, etc.

SCHILLING, C. & Co., San Francisco, Cal.
Five cases wine: Cabernet, Sauvignon, Burgundy, Zinfandel, Semillon, and others.

SCHRAM, JACOB, St. Helena, Cal.
Wines from his mountain vineyards: Hock, Riesling, and Burgundy.

SONOMA WINE AND BRANDY Co., 1 Front street, New York City.
Specimens from cellars of Geo. West, Stockton, Cal.

Catalogue of exhibitors—Class 73 *bis*.

STONE HILL WINE CO., Hermann, Mo.
Catawba, Riesling, Rulander, Concord, Norton, etc.

TOKALON VINEYARDS, H. W. Crabb, proprietor, Oakland, Cal.
Claret, Zinfandel, Chambertin, Burgundy, Riesling, etc.

VOGT, AUGUST, Willow Point, Tex.
Twelve bottles of native wine of Texas.

UNIVERSITY OF CALIFORNIA, experimental cellar, Berkeley County, Cal.
Wines assorted, vintage of 1888.

WETMORE, CHARLES A., Livermore, Alameda County, Cal.
A selection of table wines: Medoc, Sauterne, etc., from the Cresta Blanca vineyard.

WINEBERGER, Mrs. J. C., St. Helena, Cal.
Wines, sherries, and brandies, assorted.

GROUP 8.—AGRICULTURE, CULTIVATION OF THE VINE, AND FISH CULTURE.

CLASS 73 *bis*.—AGRONOMY; AGRICULTURAL STATISTICS.

AGRICULTURAL COLLEGE, State of California.
Books and reports.

CALIFORNIA STATE BOARD OF HORTICULTURE.
Volumes of reports.

DEPARTMENT OF AGRICULTURE, Washington, D. C., D. E. Salmon, Bureau of Animal Industry.
Charts showing the production of animal food and prices in the United States, also the distribution of cattle and hogs, and the comparative composition of American and European beef.

DEPARTMENT OF AGRICULTURE, Washington, D. C., William Saunders, horticulturist.
Plan of garden and grounds of the Department of Agriculture.

KANSAS, STATE OF.
Report of the Commissioner of Agriculture; official pamphlets descriptive of the resources of the State.
(*See also* Class 82.)

CLASS 73 *ter*.—ORGANIZATION, METHODS, AND APPLIANCES OF AGRICULTURAL INSTRUCTION.

DEPARTMENT OF AGRICULTURE, Washington, D. C., Prof. W. O. Atwater, Chief of Division of Experimental Stations.
Charts, plans, and photographs illustrating report on agricultural colleges and experiment stations.

RILEY, C. V., Washington, D. C.
Series of reports by himself on eco-

HOWE, LEROY.
Improved mat for horse stalls.
JACKSON, A. C.
Florida products.
LIVE-STOCK EXPRESS CO., Chicago, Ill.
Model of car for transporting dressed beef. (*See also* Class 61.)
MARVIN DRENCHING BIT CO., H. Oateman, president, 97 Chambers street, New York City.
Patent horse drenching bit, with detachable reservoir and graduated medicine glass.
REID, A. H., Philadelphia, Pa.
Dairy appliances: Churn, butter workers, butter shipping box, butter printers.
RICHMOND CEDAR WORKS, 100 Reade street, New York.
"Electric" barrel churn.
WICKES REFRIGERATOR CO.
System of cold storage.

CLASS 75.—VINE CULTIVATION.

CALIFORNIA STATE BOARD OF VITICULTURE.
Volumes of reports.
DEPARTMENT OF AGRICULTURE, Washington, D. C., B. F. Clayton, agent.
A series of views, photographic, illustrative of the industry of the vine.
RILEY, C. V., Washington, D. C.
Specimens and illustrations of phylloxera work.

CLASS 76.—USEFUL AND INJURIOUS INSECTS.

APICULTURE: Collective exhibition under the direction of the Secretary of Agriculture, Washington, D. C.
Contributors:
Armstrong, E. S., Jerseyville, Ill.
Barnes, W. F. & John, Manufacturing Company, Rockford, Ill.
Bittenbender, J. W., Knoxville, Iowa.
Dadant, Charles, & Son, Hamilton, Ill.
Demaree, G. W., Christiansburg, Ky.
Eaton, Frank A., Bluffton, Ohio.
Falconer, W. T., Jamestown, N. Y.
Heddon, James, Dowagiac, Mich.
Hubbard, J. K., Fort Wayne, Ind.
Knickerbocker, George H., Pine Plains, N. Y.

AGRICULTURE, ETC.—*Continued.*
Lewis, G. B., & Co., Watertown, Wis.
Muth, C. F., & Son, Cincinnati, Ohio.
Reese, C. H., Winchester, N. Y.
Root, A. I., Medina, Ohio.
Tinker, G. L., M. D., New Philadelphia, Ohio.
Van Deusen, James H., & Sons, Sprout Brook, N. Y.
Waveman & Crocker, Lockport, N. Y.
ALLEN, W. B., Orleans, N. Y.
Bare-rose sprinkler with stop-valve.
BELCHER, B. & J. W., Chicopee Falls, Mass.
Etna dusting gun.
BUREAU OF ENTOMOLOGY, Department of Agriculture, Washington, D. C.
Rotary blowers of poison, brush throwers, powder bellows, guns, etc.
Sixty-four samples of cocoons produced in the United States.
CALIFORNIA BELLOWS MANUFACTURING CO., San Francisco, Cal.
Insect-powder blowers.
COLLECTIVE EXHIBIT of nozzles for spraying insecticides. Prepared under the direction of the Secretary of Agriculture, Washington.
Contributors:
Foos, L. B., Boston, Mass.
Metcalf, T. O., & Co., Boston.
Rumsey & Co., Seneca Falls, N. Y.
Vose, W. T., Newton, Mass.
Fox, S. H., St. Louis, Mo.
Fowler, J. H., Oakland, Cal.
Shier, John, Ellinger, Tex.
Melcher, J. C., Black Jack Springs, Tex.
Ruhmann, J. P., Schulenburg, Tex.
Helmecke, F. A., Round Top, Tex.
Pinter, F. T., Schulenburg, Tex.
Fifield, C. W., Lowell, Mass.
Killam, J. W., Lakewood, N. J.
Campbell, John, Selma, Ala.
Nixon, A. H., Dayton, Ohio.
Lewis, P. C., Catskill, N. Y.
Woodin & Little, San Francisco, Cal.
National Manufacturing Co., Boston, Mass.
Field and Force Pump Co., Lockport, N. Y.
Hotz, N.
Clark, W. M., Newark, N. J.
Gray, J. W., Hartford, Conn.

Catalogue of exhibitors—Class 76.

COLLECTIVE EXHIBIT—*Continued.*
Crofton, John, Walnut Grove, Cal.
Greene, L. D., Walnut Grove, Cal.
Woodin & Little, San Francisco, Cal.
Riley, Dr. C. V., Washington, D. C.

DADANT, CHARLES, & SON, Hamilton, Ill.
Dadant's uncapping can with comb-rack and cloth honey strainer and wire bottom waste-pan and honey reservoir with honey gate.

DEAKIN, ROBT. J., & Co., Philadelphia, Pa.
Syringes for application of insecticides.

DOUGLAS, W. & B., Middletown, Conn.
Double acting hydronette.

GENERAL EXHIBIT of economic entomology under the direction of the Secretary of Agriculture, Washington, Dr. C. V. Riley, entomologist, Department of Agriculture.

HAMMOND, B. T., Fishkill, N. Y.
Insect-powder dusters and blowers.

KEMP, W. C. R., Orleans, Ill.
Apparatus for smoking bees.

LEWIS, P. C., Catskill, N. Y.
Bran spray syringe with rubber piston-head for application of insecticides.

MUTH, C. F., & SON, Cincinnati, Ohio.
Apparatus for the extraction of wax.

NEWCOMB, E. R., Pleasant Valley, N. Y.
Bee-keeping appliances.

RILEY, Dr. C. V., entomologist, Department of Agriculture, Washington

WHITMAN, J. A., Providence, R. I.
Single acting spray pump.

WOODASON, T. K., Chicago, Ill.
Insect powder blowers and atomizers.

GROUP 9.—HORTICULTURE.

CLASS 78.—CONSERVATORIES AND HORTICULTURAL APPARATUS.

DIVISION OF ENTOMOLOGY, Department of Agriculture, Washington, D. C.
Collective exhibit of pumps, blowers, etc.
Contributors:
Deakin & Co., Philadelphia, Pa.
Douglas, W. & B., Middletown, Conn.
Evenden, J. G., Chicago, Ill.
Heissinger, Frank H., 196 Broadway, New York.
Johnson, W. J., Newton, Mass.
Lewis, P. C., Catskill, N. Y.
National Manufacturing Co., Boston, Mass.
New England Butt Co., Providence, R. I.
Nixon, A. H., Dayton, Ohio.
Prouty, A. B., Worcester, Mass.
Rumsey & Co., Seneca Falls, N. Y.
Vose, W. T., Newtonville, Mass.

HEISSINGER, FRANK H., 196 Broadway, New York.

Catalogue of exhibitors—Social economy section.

SOCIAL ECONOMY SECTION.

(Esplanade des Invalides.)

CENTURY CO. (THE), New York City.
Publications.

DEPARTMENT OF LABOR, Washington, D. C., Carroll D. Wright, Commissioner.
Reports and publications of the National and State Bureaus of Labor.

GILMAN, REV. N. C.
Volume entitled "Profit Sharing."

HOUGHTON, MIFFLIN & CO., Cambridge, Mass.
Publications.

KNIGHTS OF LABOR OF THE UNITED STATES.
Reports, proceedings, banners, etc.

MUTUAL RESERVE FUND LIFE ASSOCIATION, E. B. Harper, president, Potter building, New York; S. D. Tyng, general director, Paris.
Charts, circulars and photographs.
(Also in Class 9.)

NELSON, N. O., MANUFACTURING CO., St. Louis, Mo.
Documents on profit-sharing.

PEACEDALE MANUFACTURING CO., Peacedale, R. I.
Charts and documents relating to profit-sharing.

PUBLICATION AGENCY OF JOHNS HOPKINS UNIVERSITY, Baltimore, Md.
Economic publications.

RAND, MCNALLY & CO., Chicago, Ill.
Railway publications, statistics, maps, etc.

UNITED STATES BUREAU OF STATISTICS AND LABOR, Washington, D. C.
Official reports of that bureau.

UNIVERSAL PEACE UNION, Philadelphia, Pa., Alfred Love, manager.
Pamphlets, illustrations, etc.

YALE & TOWNE MANUFACTURING CO., Stamford, Conn.
Post-office system.

WRIGHT, CARROLL D., Washington, D. C.
Collective exhibit, National and State Reports on Labor.

Section 3.

DEPARTMENT OF LABOR:
Massachusetts, Boston.
New York, Albany.
Connecticut, Hartford.
Illinois, Springfield.
Rhode Island, Providence.
Ohio, Columbus.
Iowa, Des Moines.
Kansas, Topeka.
Michigan, Lansing.
Labor statistics and reports.

Section 4.

BUREAU OF EDUCATION, Washington, D. C.
Reports on technical education.

CORNELL UNIVESITY, Ithaca, N. Y.
Reports and statistics on technical education.

Section 11.

SELIGMAN, EDWARD R., Columbia College, New York City.
Plans for workmen's dwellings.

TENEMENT HOUSE BUILDING CO., New York City.
Plans for workmen's dwellings.

IMPROVED DWELLINGS CO., Brooklyn, N. Y.
Plans for workmen's dwellings.

Section 12.

YOUNG MEN'S CHRISTIAN ASSOCIATION.
Photographs and plans, workmen's clubs.

Section 13.

TRAINING SCHOOL FOR NURSES, Bellevue Hospital, New York.
Methods.

WORLD'S WOMEN'S CHRISTIAN TEMPERANCE UNION.
Temperance restaurant in operation.

Section 16.

CARROLL D. WRIGHT, Washington, D. C.
COLLECTIVE EXHIBIT of the States of California, Florida, Illinois, Maine, Michigan, Missouri, New Hampshire, New York, Pennsylvania, and cities of Buffalo, Cleveland, New York, Philadelphia, Pittsburgh, San Francisco, St. Paul, Springfield, Syracuse, and Washington.

DAVID WELLS, New York.

ARTHUR HADLEY, Yale College, New Haven, Conn.
Reports on railway transportation.

The number of exhibitors in the United States Section of the Universal Exposition of 889 at Paris.

Group and class.	No.
GROUP I:	
Class 1	189
Class 2	31
Class 3	11
Class 4	1
Class 5	21
GROUP II:	
Class 6	*a* 145
Class 7	*b* 33
Class 8	*c* 91
Class 6, 7, 8	*d* 30
Class 9	*e* 140
Class 10	20
Class 11	13
Class 12	26
Class 13	3
Class 14	12
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GROUP III:	
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Class 22	2
Class 23	3
Class 24	6
Class 25	1
Class 26	8
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Class 28	11
GROUP V:	
Class 41	*f* 112
Class 42	26
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Class 45	32
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Class 47	9
GROUP VI:	
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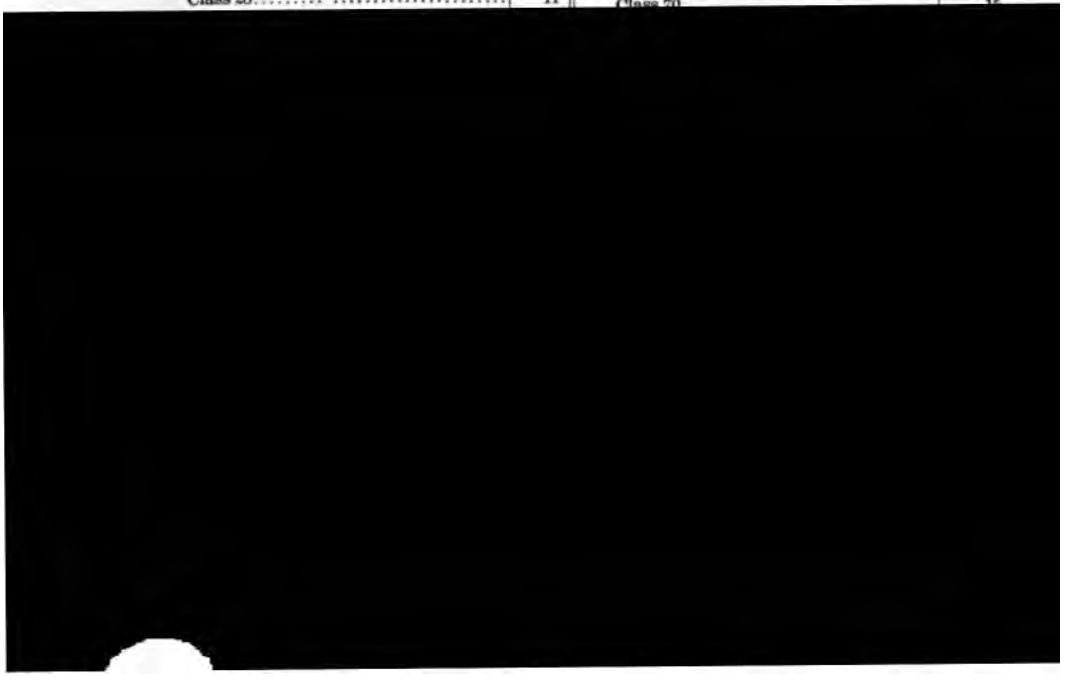
Class 49	32
Class 50	9
Class 51	5
Class 52	33
Class 53	22
Class 54	4
Class 55	3
Class 56	17
Class 57	9
Class 58	15
Class 59	15
Class 60	7
Class 61	19
Class 62	29
Class 63	25
Class 64	2
Class 65	10
GROUP VII:	
Class 67	*h* 14
Class 68	1
Class 69	18
Class 70	



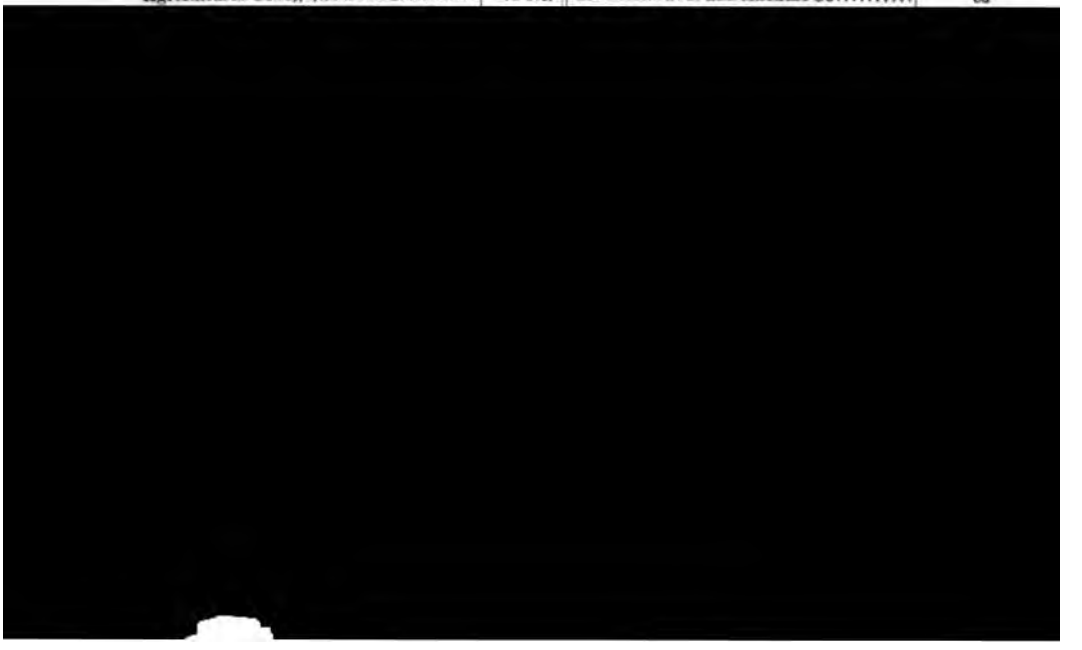
The number of exhibitors in the United States Section of the Universal Exhibition of 1889 *at Paris*—Continued.

Group and class.	No.	Group and class.	No.
RECAPITULATION.		RECAPITULATION—Continued.	
Group I	253	Group VII	15
Group II	544	Group VIII	44
Group III	90	Group IX	5
Group IV	60	Social Economy Section	31
Group V	234		
Group VI	262	Total	1,676

APPENDIX L.

ALPHABETICAL CATALOGUE OF EXHIBITORS.

Name.	Class.
Abbey, Edward A	2
Abel, Lindley	41
Abrahams, L. C., Bros. & Co. (steel brushes)	41
Academic Department University of Cincinnati, Ohio	7
Acme Manufacturing Co	42
Adam, J. S., & Co	41
Adams, S. Herbert	3
Adams, F. F., & Co	41
Adams & Sons	72
Adamson, Rutherford	73
Adder Company, The	15
Adelbert College, Cleveland, Ohio	8
Adirondack Pulp Co	10
Adirondack Railroad Company	9, 41
Administration blanks and forms for schools—Collective Exhibit	6
Agricultural and Mechanical College of Texas	8
Agricultural College, Miss	8
Agricultural College, State of California	73 *bis.*
American Bell Telephone Co	62
American Bible Society's Library, New York City	6
American Bit-Brace Co	41
American Bookseller, New York	6, 9
American Braided-Wire Co	18, 35
American Congregational Association, Boston, Mass	6
American Elevator Co	52
American Graphophone Co	62
American Institute of Electrical Engineers, New York City	8
American Leather Link Belt Company	52
American Museum of Natural History, New York City	8
American Numismatic & Archæological Society, New York City	8
American periodicals	9
American Road-Machine Co	63
American School at Athens	8
American Screw Co	53
American Tool and Machine Co	53



Catalogue of exhibitors—Alphabetical.

Name.	Class.	Name.	Class.
Atlanta University, Atlanta, Ga	8	Bell Publishing Co	9
Auganes, Hans	29	Bell, W. A	9
Ausable Horse Nail Co	41	Bell, R. W., Manufacturing Co	45
Automatic Machine Company	59	Bellevue Training School for Nurses, New York City	6, 7, 8
Avalon College, Avalon, Mo	7	Beneke Bros	86
Ayer, H. H	9	Ben Lomond Wine Co	73
Bacher, Otto H	1	Benson, Egbert	49
Bacon, Mrs. C. A	72	Benson, Frank W	1
Bacon, Henry	1	Bentzen, Charles A	51
Bacon, G. A	69	Benz, Deitch & Betz	47
Badia & Dubois	65	Berea College	8
Bagnoli Luidi	69	Berger, Adelbert	29
Bailey, C. J., & Co	28	Bergner & Engel Brewing Co	73
Bailey, Farrel & Co	38	Beringer Bros	73
Bailey, George M	41	Berkeley School, New York	6
Bailey, R. S	41, 56	Bernstrom, Victor	5
Bailey Wringing-Machine	51	Bethamy College	8
Baird, William	1	Bethel College	8
Baird, Carey & Co., Henri	9	Betz, Carl	6
Baker University, Baldwin, Kan	9	Bickford, C. A	9
Baker, E. J	9	Binford, James R	44
Baldwin University, Berea, Ohio	8	Binghamton Hydraulic Power Co	52
Baldwin, A. A., N. Y	9	Birney, William Verplanck	1
Baldwin & Gleason Co., Limited	11	Bisbing, Henry S	1
Baltimore Medical College, Baltimore, Md	8	Bishop, Major D. E	61
Baltimore (Md.) Public Schools	6	Bissell Carpet-Sweeper Co	26
Bancroft, John, & Bloede	46	Blairsville Ladies' Seminary, Blairsville, Pa	8
Bangor Library, Bangor, Maine	6	Blake, John Henry	52
Bardeen, C. W	6, 9	Blake, Theodore A	48
Barker, George, Niagara Falls, N. Y	12	Blake, William P	41
Barnard, Edward H	1	Blakstone, Miss Sadie	1
Barnes, A. S., & Co	9	Blanchard Brothers & Lane	45
Barnet, J. S., & Brother	45	Blanchard Slate Co	41
Barnum, Richardson & Co	41	Blashfield, Edwin Howland	1, 2
Barrett, F. N	9	Bliss, E. W., & Co	53
Barrie, George	9	Block, Benoit	12
Bartlett, P. W	3	Blood Brothers	49
Batcheller & Sons' Co	49	Blum, Robert F	1, 2
Bates College, Lewiston, Maine	8	Board of Education, Brooklyn, N. Y	6
Battle Creek College, Battle Creek, Mich	8	Board of Education, Cincinnati, Ohio	6
Baumgarten, J., & Son	9	Board of Education of Wisconsin, Madison, Wis	6, 7
Baxter, Richard	46	Board of Education, Grand Rapids, Mich	6, 7
Bayless Business College, Dubuque	8	Board of Trade, Chicago	67
Beadleston & Woerz	73	Board of Trade, Minneapolis	67
Beal, J. H	12	Boaz Mining Company	41
Beardsly Library, West Winsted, Conn	6	Bobrick, G. A., & Co	7
Beatty, Claudius F	9	Boggs, Frank M	1
Beaux, Miss	1	Bohman, H	13
Beck, Adolphe	73	Bolen & Byrne	73
Beckwith, J. Carroll	1	Booth, Mary A	15
Belcher, B. & J. W	76	Bondford, James R	—
Belden, A. L	9	Borie Mailing Machine Co	58
Bell, Edward A	1		

Catalogue of exhibitors—Alphabetical.

Name.	Class.
Borne, Scrymser & Co	45
Boston College, Boston, Mass	8
Boston & Albany R. R. Library	9
Boston & Maine R. R. Co	9
Boston (Mass.) Public Schools	6, 7
Boston Rubber-Shoe Co	39, 45
Boston University, Boston, Mass	8
Bowdoin College, Brunswick, Me	8
Bowen, D	41
Bowker, R. R	9
Boyce, S. S	44
Boyce Fiber Co	44
Boyden, Frederick D	1
Boyden Power-Brake Co	61
Boynton Public Library, Templeton, Mass	8
Bradley & Co	49
Bragg, Allen B	9
Brainard Quarry Co	41
Brandegee, Robert B	1
Breck, John L	1
Brentano, A	9
Brewington, Bainbridge & Co	41
Bricher, Alfred T	1
Brickell, William D	9
Bridgman, Frederick Arthur	1
Bristol, John Bunyan	1
Bristol Copper and Silver Mining Co	41
Brookhaven Rubber-Shoe Co	44
Brooklyn Library	9
Brooks, Maria	1
Brooks, Caroline S	11
Brooks, Henry	42
Buffalo Stained-Glass Works	19
Bunker Hill Mining and Concentrating Co	41
Bunker Hill and Sullivan Mining Co	41
Bureau of Education, Dept. of the Interior, Washington, D. C	*8, 7, 6
Bureau of Engraving and Printing, Washington	9
Bureau of Entomology, Dept. of Agriculture	76
Bureau of Ethnology	8
Burdett, F. T	9
Burgess, Miss M	9
Burk Bros	47
Burroughs, Wellcome & Co	46
Burnham, Dr. E. S	45
Burr, W. H	9
Business College Catalogues	6, 7, 8
Butchers' Publishing Co. (The)	9
Butler, George B	1
Butler, Howard Russell	1
Butler University, Irvington, Ind	8
Butler, A. P	67
Butterworth, Ben., M. C	9
Cactus Mining Co	41
Cahil, M. S., & Co	45
California Bellows Manuf. Co	76
California Redwood Lumber Association	42
California Dried-Fruit Association	71
California State Viticultural Commission "Experimental Cellar"	73
California State Board of Horticulture	73 *bis*

Catalogue of exhibitors—Alphabetical.

Name.	Class.
Castle, William H	29, 41
Cathedral School of St. Paul	6
Catalogues of Secondary Schools	7
Cauldwell, Leslie Giffen	1
Caw's Ink and Pen Co	10
C. and C. Electric Motor Co	62
Central Collegiate Institute, Altus, Ark	8
Central University of Iowa, Pella, Iowa	8
Central Wesleyan College, Warrenton, Mo	8
Century Co. (The)	*9
Central College, Fayette, Mo	8
Chadborn & Coldwell Manufacturing Co	49
Chaddock College, Quincy, Ill	8
Chamberlain, D. C	16
Chambersburgh Public Schools	6
Champagne, E	12
Chanut, Jean M	35
Chapman, Carlton T	1
Chapman, Lewis M	57
Chapin Manufacturing Co	60
Charlotte Female Institute, Charlotte, N. C	7
Charleston (W. Va.) Free Schools	6
Charleston Library Society, Charleston, S. C	6
Chase, William M	1
Chattanooga University, Chattanooga, Tenn	8
Chautauqua Association	6, 7
Chauché, A. G	73
Cheney Bros	33
Chesebrough Manufacturing Co	45
Chicago Historical Society	8
Chicago (Illinois Public Schools	6
Chicago Law Institute Library	8
Chicago Medical School	8
Chicago Public Library	6
Chicago Rawhide Manufacturing Co	52
Chicago Theological Seminary	8
Chief Commissioner of Highways, Philadelphia, Pa	9
Chollet, Eugene	6
Chowan Baptist Female Seminary, Murfreesboro, N	7
Christian Brothers' College, Memphis, Tenn	7
Christiansen Institute, Brooklyn, N. Y	6
Christian University, Canton, Mo	8
City and Town School Reports, Collective Exhibit	6
Claflin University, Orangeburgh, S. C	8
Clagett, F	71
Clark, John F	9
Clark, D. R	12
Clark, Washington A	
Clark & Wise Co	45
Clarke, A. F	44
Claverack College, Claverack, N. Y	8
Clegg, Charles A	59
Cleveland, A. B., & Co	71
Cleveland (Ohio) Public Schools	6
Cleveland Tin Mining Co	41
Clionian Literary Society Library	9
Closson, W. B	5
Clough & Maconnel	59
Cobb Vulcanite Wire Co	62
Coffin, William Anderson	1
Cohen & Co	9
Colby University	8
Cold Water Public Schools	6, 7
Cole, J. Foxcroft	1
Cole, T	5
Cole, George W	9
Coleman, A	45
Colgate & Co	28
Collamore, Davis & Company, Limited	19
Collective Exhibit of ores	41
Collective Exhibit of tobacco	44
Collective Exhibit of hay and grasses	44
Collective Exhibit of cereals	67
College and University Catalogues	8
College of Emporia	8
College of the City of New York	8
College of New Jersey	8
College of Physicians, Philadelphia, Pa	8
College of Physicians and Surgeons, Baltimore, Md	8
Collegiate and Polytechnic Institute, Brooklyn, N. Y	8
Collins's, S., Son, & Company	45
Colné, Charles	62
Colorado Institution for the Deaf and Blind	6
Colt's Patent Fire-Arms Manufacturing Co	38, 52
Columbia Athenæum, Columbia, Tenn	7
Columbia College	9
Columbia Female College, Columbia, S. C	8
Columbia Type-Writer Manufacturing Co	59
Columbian University, Washington, D. C	8
Columbus (Ohio) Public Schools	6
Colvin, Verplanck	16
Comet Mining Co	41
Comfort Consolidated Mining Co	41
Commercial Cable Co	62, 65
Commissioners of Schools of Missouri	6
Congress Mining Company	41
Connolly Brothers, J. A., A. A., & Jos. B.	62

* And Social Economy Section.

Catalogue of exhibitors—Alphabetical.

Name.	Class.
Conroy, C. C., & Comfort, S	41
Consolidated Telegraph and Electrical Subway Co	62
Contanseau, L	9
Convent of the Good Shepherd, Newport, Ky	6
Convent of St. Augustine	72
Conway Springs Co	72
Cook, G. H	16
Cook, A. R., & Co	24
Coolidge, Baldwin	12
Co-operative Building Plan Association	11
Cooper Union, New York City	6, 7, 8
Coosaw Mines	41, 49
Cope, E. D	8
Copeland, Alfred B	1
Copper Basin Mining Company	41
Corbin, P. and F	41, 63
Cordley & Hayes	42
Cornell College, Mt. Vernon, Iowa	8
Cornell University, Ithaca, N. Y	*8
Cotton-Seed Oil Product Co	44, 45
Cowdrey, E., & Co	70
Cowles Electric Smelting and Aluminum Co	41
Cox, Kenyon	1, 2
Coxe, Eckley B	48
Cox, G. C	12
Coxe, Reginald Cleveland	2
Crabb, H. W	73
Craft, N. W	73
Craig, W. O	73
[illegible]	[illegible]

Name.	Class.
Davenport College, Lenoir, N. C	8
Davidson, H	5
Davidson, H. E	43
Davis, Charles H	1
Davis, John P	5
Davis, H. J	41
Davis Sewing-Machine Co	56
Day, Frederick W	41
Day and Home School, Mobile, Ala	6
Dayton Public Library	6
Deadhorse Claim	41
Deakin, Robt. J., & Co	76
De Bernales & Co	23, 27
De Broen, Josephine	*9
Delachaux, Léon D	1
Delaware College	8
Delaware and Hudson Canal Company	41
Delhi Mine	41
Dellac, Madame S	36
Demuth, William, & Co	29
Denison, S. P., & Man, W. G	62
Denman, H	1
Department of Agriculture	16, 31, 32, 33, 42, 44, 49, 50, 69, 71, 72, 73, *bis*, 73*ter*, 74, 75, 76, 78, 82
Department of Education of South Carolina	6
Departments of Labor, Coll. Exhibit	(†)
[illegible]	[illegible]

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Catalogue of exhibitors—Alphabetical.

Name.	Class.
Dion, Charles	13, 62
Division of Pomology, U. S. Department of Agriculture	71, 81
Doane College	8
Dodd, Mead & Co.	9
Dodge, William L	1
Dodge Manufacturing Company	52
Dodson, Sarah P. B.	1
Dolliver, James W	65
Dolph, The A. M., Co	51
Dolph, John H.	1
Donald, G. L.	9
Donoho, G. Ruger.	1
Dopp, H. Wm., & Son	27
Douglas Library, Canaan, Conn	9
Douglas, W. & B	49, 52, 76
Douglas Sugar Co.	72
Douglass & Wilson	58
Doussan French Perfumery Co	28
Dow, Arthur W	1
Dowst, Lewis	9
Drake, William H	2
Drake Company	37, 41
Drum Lummon Mine	41
Drury College, Springfield, Mo	8
Dummer Academy, South Byfield, Mass.	7
Dunlap, R., & Co	36
Dutton, H. & F.	44
Dyer, Charles Gifford	1
Eagle Condensed-Milk Co	69
Eakins, Thomas	1
Earlham College	8
East Florida Seminary	7
Eastman Business College	6, 7, 8
Eastman Dry Plate & Film Co	12
Eaton, C. Harry	1
Eaton, Wyatt	1
Eaton, J. H.	56
Eclectic Medical College	8
Edge Hill Wine Co.	73
Edison, Thomas A.	62
Educational Gazette Co.	9
Educational Publishing Co	6, 9
Edward L. Pierce Library	9
Edwards, B., & Co.	9
Edwards, Morton A.	11
Eighty six Mines.	41
Electric Power Publishing Co., New York City.	9
Electrical Supply Co.	62
Electrical Collective Exhibition by U. S. Commission	62
Electrine Company	58
Electron Manufacturing Co	62
Elgin Condensed-Milk Co	69
Elizabeth (N. J.) Public Schools	6
Emerson & Midgley	52
Emory College.	8
Empire Granite Co	63
Engineers' Club of Philadelphia	8
Engineering School Catalogue	8
Enoch Pratt Free Library	6
Enterprise Manufacturing Co. of Pennsylvania	41
Enterprise Manufacturing Co., Ohio.	50, 74
Episcopal Theological School	7
Erie Preserving Co	71
Estes & Lauriat	9
Estes, E. C., & Sons	29
Eureka Fire Hose	55
Eureka College	8
Evanhoe, Frank N.	18
Evansville (Ind.) Public Schools	6
Ewer & Atkinson	73
Ewing College	8
Fairchild, Leroy W., & Co.	10, 24, 37
Fairchild Brothers & Foster	45
Fairmount State Normal School, Fairmount, W. Va	7
Farley, William	14
Farny, Henry F.	1
Farrer, Henry.	2
Farrington, Cleopatra K	14
Fawcett, Alice K.	72
Fay Library, Southborough, Mass	8
Fay, J. A., & Co	57
Fairweather & Ladow	42
Fell, George E.	14
Fernow, E. B.	42, 49
Ferriss, F. A., & Co	70
Fible et Crabb	73
Findlay, Samuel	9
Fishel, Adler & Schwartz	9
Fisher, Mark	1
Fisher, Clark	61
Fiske Free Library, Claremont, N. H	8
Fiske, Harrison Grey	9
Fleming Manufacturing Co	61, 63
Florida Collective Exhibit	44
Florida State Horticultural Society	71
Florida Wine Co	73
Folding-Trunk Co	39
Follmer, Clogg & Co	35
Foote, Mary Hallock	2
Foote, Albert Edward	6, 16, 41
Forbes, Chas. F.	1
Forbes & Paige	9
Ford, Edwin	19
Fort Worth Daily Gazette Co	8
Fort Worth (Texas) Public Schools	6

Catalogue of exhibitors—Alphabetical.

Name.	Class.
Fowler, Frank	1
Fox, William F	9
Fradley, J. F., & Co	37
Franco-American Soup Co	70
Frank, F. A., & Co	27, 41, 51
Frank's heirs, Dr. M	9
Franklin & Co	36
Franklin College, New Athens, Ohio	8
Franklin College, Franklin, Ind	8
Franklin Institute, Philadelphia, Pa	8
Franklin Typographical Society, Boston, Mass	8
Free Evening Industrial and Drawing School	6, 7, 8
Free Public Library, Alameda, Cal	8
Free Public Library, Auburn, Mass	8
Free Public Library, Burlington, Iowa	6
Free Public Library, Topeka, Kans	6
Free Public Library, Uxbridge, Mass	6
Freer, Frederick W	1
Freidenker Publishing Co	9
Fremery, Felix	44
French, Daniel C	3
French, Frank	5
French, George	9
French School, House of Refuge	6
Frers, C. A	14
Friedenwald Brothers	55
Friedlander, A., & Co	36
Friend's Free Library, Germantown	6
Frindley, Samuel, Akron, Ohio	6
Fromont, Henri	19
Fuller, Geo	1
Georgetown College, Georgetown, Ky	8
Georgetown University	8
German-English College	7
Gesner, John F	68
Gibson, M. Hamilton	2
Gifford, Robert Swain	1
Gill, Miss R. Lorraine	1
Gillis Bros. & Turnure	9
Giles, F. S., & Bros	26
Gilman, N. C	(*)
Ginn & Co	7, 9
Glen Cove Manufacturing Co	67
Glover & Chandler	49
Goddard Seminary	7
Golding & Co	58
Goodman & Dickerson	9
Goodrich, E. E	69
Gorham Manufacturing Co	24, 29
Gould's Manufacturing Co	49, 52
Gould & Woolley	9
Grand Traverse College, Benzonia, Mich.	8
Grant Memorial University, Athens, Tenn	8
Graves, Abbott	1
Gray, Elisha	62
Greatorex, Miss Eleanor Elizabeth	1
Greatorex, Miss Eliza	2
Greatorex, Miss Kathleen H	2
Greenbaum, Alfred	73
Green Mountain Stock Farm	69
Greenough, Walter C	19
Greensborough Female College, Greensborough, N. C	7

Catalogue of exhibitors—Alphabetical.

Name.	Class.	Name.	Class.
Hammond, B. T.	76	Henry Edward L.	1
Hammond Type-Writer Company.	59	Herring & Co	63
Hampden Sidney College	8	Heywood Bros. & Co	17
Hampton Public Library	6	Hickok, Dervey K.	29
Hanover College	8	Higbee, E. E.	9
Hanson Van Winkle & Co.	62	Higganum Manufacturing Corporation.	49
Haraszthy Arpad & Co.	73	Highland University	8
Harlem Library	8	Higley Sawing and Drilling Machine Co.	53
Harney Peak Tin Mining Co.	41	Hilgard, Prof W E.	73
Harrell, Eugene G.	9	Hinckley Robert	1
Harris, E. P.	9	Hinson, W. Q.	44
Harris, J. B	9	Historical Society of Delaware	8
Harris, Joseph	29	Historical Society of Montana	8
Harris, Joseph, Seed Co.	71	Hitchcock, George	1
Harris, Nathaniel R.	11	Hiwassee College	8
Harrison, Alexander	1	Hodges, N. D. C.	9
Harrison, Birge	1	Hoffman, Lena M.	14
Harrison, Butler	1	Hoffmier, A. K.	61
Hart, A. H., & Co.	31	Hoggson & Pettis Manufacturing Co.	53, 59
Hart, Jas. M.	1	Holbrook, J., & Sons	73
Hartford Woven Wire Mattress Co.	17	Hollerith, Herman	15
Hartman Manufacturing Company	41	Holmes, Eben	65
Hartrick, Ed	28	Home for Feeble-Minded Children, California	6
Hartshorn, Stewart	41	Homeopathic Medical College	8
Hartsville College	8	Homer Winslow	2
Harvard Daily Crimson	9	Homestake Mining Co.	41
Harvard Medical School	8	Hooper Geo. F	69, 71, 73
Harwood Manufacturing Co	6, 7	Hopedale Public Library	8
Haskell, Ida C	2	Horne, A. R	9
Haskin, Samuel E.	42	Horsey Manufacturing Co.	29
Hassam, Childe	1	Horton, E., & Son Company	52, 53
Hatch, Dan	41	Horton, Angell & Co.	37
Haverford College, Montgomery Co., Pa.	8	Hough, Romeyn B	42
Hawkes, T. G	19	Hough & Ford	36
Hawkins, W. B	44	Houghton, H., & Co.	29
Hayden, Charles Henry	1	Houghton, W. V., & Co.	28
Hayes, George	63	Houghton, Mifflin & Co	*9
Hays, J. Minis	9	House Painting and Decoration Co	9
Healy, G. P. A	1	Hovenden, Thomas	1
Healy & Millet	19	Howard, A. H.	40
Healey & Company	60	Howard Female College, Gallatin, Tenn	7
Heath, D. C., & Co.	7, 9	Howard Lockwood & Co	9
Heath, H. C., & Brother	9	Howard Strop Co	29
Hedding College	8	Howard University	8
Heidelberg College	8	Howe, Leroy	74
Heine, August	49	Howe, William H.	1
Heinrich, H. H.	26	Howes, Simeon	49
Heinz, H. J., Co	72	Howland, Alfred C.	1
Heisler Electric Light Co.	62	Huckins, J. H. W., & Co	70
Heissinger, Frank	78	Humbert, Henry, & Co	70
Heldt, Louis	19	Humboldt Lumber Manufacturers' Association	49
Held, Charles	3	Hume & Co	73
Helvetia Condensed Milk Co.	69	Huntington, Daniel	1
Hennessy, William J.	1		
Henry, C. Edward	19		

* And Social Economy Section.

Catalogue of exhibitors—Alphabetical.

Name.	Class.
Huntsville Female College, Huntsville, Ala	8
Hurlburt Brothers	42
Hurtubise, Alexander	49
Husman, Prof. George	73
Hutchins, Stilson	58
Hyatt School-Slate Co	6
Hyde, W. H	1
Hydrographic Office	16
Idaho Quartz Mining Co	41
Improved Dwellings Co	(*)
Imperial Mine	41
Indian Industrial School	6, 7, 8
Indiana State Medical Society	8
Indiana University	8
Indianapolis (Ind.) Public Schools	6
Ingersoll, Prof. C. L	67
Ingersoll Rock Drill Company	48
Inland Printer Co	9
Inloes, William H	61
Inness, Geo., jr	2
Inness, George	1
Inspector of Finance of Vermont	9
Institute for Training Colored Ministers	7
Institute of Our Lady of the Sacred Heart	6
Insurance Department of Connecticut	9
Insurance Department of New Jersey	9
Insurance Department, Lansing, Mich	9
Insurance Commissioners of Kansas	9
Insurance Department of Wisconsin	9
Insurance Department of Pennsylvania	9
Interior Department, U. S	9
International Button-Hole Sewing-Ma-	
Jewett, The John C., Manufacturing Co	41
Jones, H. Bolton	1
Jones, J. T	44
Johns Hopkins University Publication Agency	*8, 9
Johnson, Alfred	56
Johnson, B. F., & Co	9
Johnson, Charles J., & Co	9
Johnson, Eastman	1
Johnson, T	5
Johnston Harvester Co	49
Johnston, Henry M	45
Johnston, Samuel, & Co	49
Johnston, W. I	9
Johnston, W. J., Co., Limited	9, 62
Johnston (R. I.) Public Schools	6
Journals of Education, Collective Exhibit	6
Justice Bateman & Co	44
Kahenn, A., & Co	26
Kansas City (Missouri) Public Schools	6
Kansas, State of	73 *bis*
Kansas State Agricultural College	6, 7, 8
Kavanagh, John	1
Keachie College	7
Kellog, Miss Alice D	1
Kellogg & Macdougall	44
Kelly, J. M	9
Kemp, W. C. R	76
Kemper Hall	7
Kenealy, Alex. C	9
Kennett, T. A	9
Kennon, Gray & Co	71

Catalogue of exhibitors—Alphabetical.

Name.	Class.
Knitted Mattress Co	17
Knowd, John J	41
Knox College, Galesburgh, Ill	7
Knox, Thomas W	9
Knox, J. Armory	9
Koch, A. B., Company	63
Koehler, Robert	1
Kohler & Frohling	73
Korbel, F., & Brothers	42
Kruell, G	5
Krug, Charles	73
Kruse Check and Adding Machine Co	59
Kunz, George F	41
Kunz, Joseph	73
La Chaise, Eugene A	1
Ladd & Coffin	28
La Farge, John	19
Lafayette College	8
Laird, B. F	61
Lake Erie Seminary	7
Lake Forest University	8
Lambie, R. M	17
Lamson Consolidated Store Service	59
Landy, James	12
Lane Mills	30
Lane University	8
Larkin, J. D., & Co	45
Lasar, Charles	1
La Salle College	8
Lash, Lee	1
Laudon, Mrs. Weston	9
Lawrence, R. F., & Co	39-41
Lea Brothers & Co	9
Leavenworth & Burr Publishing Co	9
Lebanon Valley College	8
Lehigh College	8
Lehigh University	8, 6, 7
Lehigh Valley Creosoting Co	63
Leinbach, Felix W	59
Leitner, H. D	44
Le Long, B. F	42
Lepage Glue Co	45
Lesley, J. P	16
Lewis, P. C	76
Lewiston (Maine) Public Schools	6
Libbey & Co	70
Liberty Machine Works	58
Library Association	9
Library Catalogues, Coll. Exhibit	6
Lick Observatory	8
Lincoln Bessemer Company	41
Lincoln Mill Co	42
Lindenthal, Gustav	63
Lindsay, Robert M	9
Lindsy, Albert M	5
Lippincott, J. B., & Co	6, 9
Lippman, Philip	35
Lithgow Library	9
Little, A. P	10
Live-Stock Express Co	74
Lloyd & Supplee Hardware Co	49
Lloyd, James	12
Lockwood, Robert W	1
Logan Female College	8
Lombard University	8
Loughbridge, Prof. R. H	44
Loomis, Eurilda Q	1
Lorenz, George	28
Loring, Francis William	1
Lothrop, D., & Co	9
Low, William H	2
Low, J. G. & J. F	20
Lowell Commercial College	8
Lowell, John A., & Co	9, 10, 11
Lubin, Siegmund	15
Lucy Kolb Institute	7
Lugano, C	15, 45
Lutcher & Moore	49
Luther College	8
Lutheran Theological Seminary	8
Lutted, James	72
Lyman, Joseph	1
Lynch, James	44
Lyon, Amasa, & Co	35
Macann, John A	9
Macbeth, George A., & Co	19
Macelurg, A. C., & Co	9
MacCoy, James S	57
MacEwen, Walter	1
Mackellar, Smiths & Jordan Co	58
Mackay & Copeland Lasting-Machine Co	56
MacMonnies, Frederick	3
MacNaughtan's, W., Sons	44
Macy, William S	1
Madison University, Hamilton, N. Y	8
Magnolia Mines	41, 49
Magnolia Anti-Friction Metal Co	41
Maillard, Henry	11, 50, 72
Maine Red Granite Company	41
Mallon, John, Pacific Art Glassworks	19
Mallory, E. B., & Co	71
Manual Training School, St. Louis, Mo	6, 7, 8
Manufacturer and Builder	9
Mansfield, J. E	67
Manufacturers and Mechanics' Library Association, Lewiston, Maine	6
Manhattan College, New York City	8
Mann, C. A., & Co	28

Catalogue of exhibitors—Alphabetical.

Name.	Class.
Marianna (Arkansas) Institute	6
Marion Female College, Marion, Va	7
Maris Machine Co	41
Marks Adjustable Folding-Chair Co	17, 39
Marriott, F	9
Marsh & Company	41
Marshall, T. P	41
Martin & Martin	60
Martin, Wagner & Co	71
Martinez, Ybor & Co	44
Marvin Drenching Bit Co	74
Marx, Ernest	12
Mason, Volney W., & Co	52
Mason & Rich	9
Mason, James B	9
Massachusetts College of Pharmacy, Boston, Mass	8
Massachusetts Insurance Commission, Boston, Mass	9
Massachusetts Normal School, Worcester, Mass	7
Massachusetts Society for the Promotion of Agriculture	42
Mast, Foos & Co	49, 52
Master Car-Builders' Association, New York City	8
Masters, Geo	9
Mathews, Arthur F	1
Matthews, Geo. E., & Co	9
Matthews, J	73
Mayer, Strouse & Co	35
McCormick Harvesting Machine Co	49
McCoy, M. P	58
Merklen Brothers	17
Merriam, G. C., & Co., Springfield, Mass	6, 9
Merrill, M. J	41
Mexican Phosphate and Sulphur Co	49
Meyer, Henry C	9
Meza, Wilson de	1
Michener, J. H., & Co	69, 70
Michigan Female Seminary, Kalamazoo, Mich	7
Michigan Radiator and Iron Manufacturing Co	7, 27
Middlebury College, Middlebury, Vt	8
Middlesex Mills	32
Mills, Wm., & Son	43
Miller, Charles Henry	1
Miller, Edward L	58
Miller, George, & Son	72
Miller, Horace C	9
Miller Lock Company	41, 63
Millet, F. D	1
Miner, Wm. C	9
Minnesota School for Deaf, Faribault, Minn	6
Minnesota State Geological Survey, Minneapolis, Minn	16
Minor, Robert C	1
Mississippi College, Clinton, Miss	8
Mitchell, J. J., & Co	9
Mitchell, Lazar & Co	41
Mohr, Charles	49
Moline Public Schools	6
Molleer, L	1
Montgomery Brewing Co	75

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Name.	Class.	Name.	Class.
Muhlenburg College, Allentown, Pa	8	New York Evangelist Co., New York City	9
Muller, R	5	New York and Georgia Manganese and Iron Co	41
Munson, J. V	72	New York Hospital Library, New York City	8
Munson Lightning Conductor Co	62	New York House of Refuge, School Department	6
Muscatine Commercial College, Muscatine, Iowa	8	New York Medical Association, New York	8
Muskingum College, New Concord, Ohio	8	New York Mercantile Library Association, New York City	6
Mutchmore & Co., Philadelphia, Pa	9	New York Observer Co	9
Muth, C. C., & Son	76	New York Polyclinic	8
Mutual Reserve Fund Life Assoc	(*)	New York State Agricultural Society	9
Myer, Thomas J., & Co	71	New Urbana Wine Co	73
Myers, Frederick	59	Niagara University, Buffalo Law School, Buffalo, N. Y	7
Myrick, Herbert	9	Nichol's Latin School, Lewiston, Me	6
Mystic Valley Institute, Mystic Bridge, Conn	6	Nicholson, J. W	14
Napa Valley Wine Co	73	Nicoll, James Craig	1, 2
Nassau Manufacturing Co	10	Normal School, Tuskagee, Ala	7
National Academy of Science	9	Norman Williams Public Library	6
National Bureau of Education	6	Northern Pacific Railroad Co	42, 67
National Cash Register Co	59	Northfield Seminary, Franklin County, Mass	7
National Cordage Co	54	Northrup Manufacturing Co	52
National Deaf-Mute College	6	North Star Gold Mining Co	41
National Electric-Light Association	9	Northwestern College, Naperville, Ill	8
National Law School	8	Northwestern University, Evanston, Ill	8
National Soldiers' Home	64	Norton, Captain, yacht "Neversink"	95
National Woman's Christian Temperance Union	6	Norton Public Library, Norton, Mass	6
Nautical Almanac	9	Norwood, E. Steinheimer	9
Navy Department, U. S	9	Nouveau Clos Vougeot Vineyard	73
Nebraska Central College	8	Noyes, Joseph P	35
Nettleton, Walter E	1	Numsens, William, & Sons	71
Nelson Manufacturing Co	(*)	Nutrizio, Henry	27, 41
Nevada Mineral Exhibit	41	Nutt, John J	9
Newburgh (N. Y.) Public Schools	6	Nye, Wm	44
Newcomb, E. R	72, 76	Oberlin College, Hiram, Ohio	8
New England Brown-Stone Co	41	Odd Fellows Library Association, San Francisco, Cal	1
New England Publishing Co	6, 9	Ogontz School for Young Ladies, Ogontz, Pa	7
Newhall, H. M., & Co	41	Ogden College, Bowling Green, Ky	8
New Haven Historical Society	8	O'Halloran, Miss A	1
New Haven (Conn.) Public Schools	6	Ohio Commissioners of Schools, Columbus, Ohio	6
New Home Sewing-Machine Co	56	Ohio Institute for Feeble-minded Children	6
New Jersey Zinc and Iron Co	41	Ohio State University, Columbus, Ohio	8
Newland, Henry A., & Co	43	Ohio Wesleyan University, Delaware, Ohio	8
Newman, Carl	1	Oh Joe Mine	41
New Orleans Cotton Exchange	44	Okonite Company	62
New Orleans University	8		
New Windsor College, New Windsor, Md	8		
New York Academy of Medicine, New York City	8		
New York Bank-Note Co., Broadway, New York, N. Y	9		
New York Car Wheel Works	61		
New York City Public Schools	6		
New York Commercial Co. (Limited)	61		

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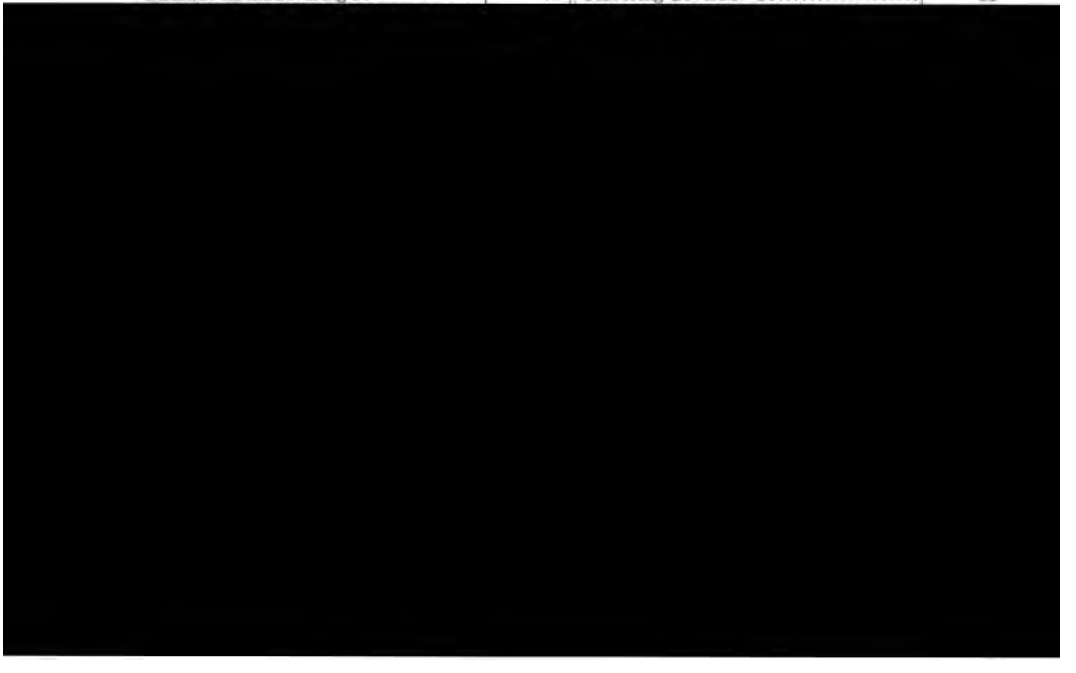
Name.	Class.
Olivet College, Olivet, Mich	8
Omaha (Nebraska) Public Schools	6
Oneida Historical Society, Utica, N. Y	7
Ontario Mining Co	41
Orange Judd Co. (The)	9
Orange Public Library, Orange, California	7
Oregon Iron and Steel Co	41
Oregon School for Deaf Mutes, Salem, Oregon	6
Orestott, Placer Co	71
Original Empire Mill and Mining Co	41
Oro Bella Mining Co	41
Osborn, John, Son & Co	73
Osborn, Prof. Henry S	16
Osborne, D. M., & Co	49
Osgood, N. A	43
Oskaloosa College, Oskaloosa, Iowa	8
Oskaloosa (Iowa) Public Schools	6
Osman Brother	9
Oswego City Library	7
Otis Brothers & Co	52
Ottawa University, Ottawa, Kan	8
Otterbein University, Westerville, Ohio	8
Our Lady of Angels Seminary and College, Suspension Bridge, N. Y	8
Outing Publishing Co	9
Pacific Methodist College, Santa Rosa, Cal	8
Pacific Orchard Cannery	71
Packard, Prof. A. S	9
Paine Shoe Lasting Machine Co	56
Palisade Manufacturing Co	72
Pennell, Joseph	2
Pennell Institute, Gray, Me	7
Pennington Seminary, Pennington, N. J.	7
Penn School, S. Helena Island, South Carolina	6
Pennsylvania Military Academy, Chester, Pa	7
Pennsylvania Oral School for the Deaf, Scranton, Pa	6
Pennsylvania Training School	6
Pennsylvania Railroad Company	61
Perkins Institution and Massachusetts School for the Blind, Boston, Mass.	6
Perrin & Smith, St. Louis, Mo	6, 9
Perry, jr., E. Wood	1
Perry, F. H	71
Peters, Clinton	1
Peters, W. C	9
Peterson, Waldemar	9
Phelps, Geo. M	9
Philadelphia College of Pharmacy	8
Philadelphia Manual Training School	6, 7, 8
Philadelphia Novelty Co	10, 23, 27
Philadelphia Novelty Manuf. Co	41
Philadelphia Polyclinic and College for Graduates in Medicine, Philadelphia, Pa	7
Philadelphia Seminary	7
Philander Smith College, Little Rock, Ark	8
Phillips, C. C	50
Photo-Electrotype Engraving Co	9
Pickering Governor Co	52



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Name.	Class.
Prang, L., & Co	9, 10, 11
Pratt, D. C.	6
Presbyterian Historical Society, Philadelphia, Pa	8
Preserve Co., The	72
Preserving and Canning Co	72
Price, Professor Thomas	41
Providence (R. I.) Public Schools	6
Public Library, Ayer, Mass	6
Public Library, Belleville, Ill	6
Public Library, Bryan, Ohio	6
Public Library, Chelsea, Mass	6
Public Library, Fitchburg, Mass	6
Public Library, Portland, Me	6
Public Library, Poughkeepsie, N. Y.	6
Public Library, Somerville, Mass	6
Public Library, Southbridge, Mass	6
Public Library, St. Louis, Mo	6
Public Library, Taunton, Mass	6
Public Library, Toledo, Ohio	6
Public Library, West Brookfield, Mass	6
Public Library, Warren, Mass	6
Public School Journal Co., Mt. Washington, Ohio	9
Public Schools, Cincinnati, Ohio	6
Publishers' Weekly	9
Purdue University, La Fayette, Ind	8
Puget Sound Iron Company	41
Purity Wine Co	73
Putnam, S. G	5
Queen City Chemical Co	68
Racine College	8
Railroad Commissioners of Alabama	9
Railroad Commissioners of Connecticut	9
Railroad Commission of Iowa	9
Railroad Commissioners of Virginia	9
Railroad Commission of Wisconsin	9
Railway Commission of Ohio	9
Railway News Co	61, 65
Rand, McNally & Co	*6, 9, 16
Randall, J. A., & Co., Publishers	9
Randol, J. B	41
Ransom, C. M	9
Rath, Arthur	11
Raub, Albert N	9
Raymond Public Library	8
Redwood, A. C	2
Reed, J. Van D	52
Reid, Adam	27
Reid, A. H	41, 57, 74
Reid, Robert	1
Reilly, D. J., & Co	58
Reinhart, Charles Stanley	1, 2
Remington, Frederick	1, 2
Renouf, A. Vincent	1
Rensselaer Polytechnic Institute	6, 7, 8
Rensselaer Society of Engineers	8
Revere Rubber Co	45
Rhode Island Hospital Library	8
Rhode Island School for the Deaf	7
Rhodes, Richard S	14
Rice, William M. J	1
Richards, Samuel	1
Richards, William T	1, 2
Richardson & Robbins	70
Richmond Cedar Works, Limited	29, 42, 74
Richmond Theological Seminary	8
Ricksecker, Theodore	28
Rider, S. A., & Co	37
Rifes Hydraulic-Engine Manufacturing Co	52
Riley, C. V	73 *ter*, 75, 76
Rimmersburg Public Schools	6
Rixford, G. P	68, 71
Roanoke College	8
Robbins, Horace W	1
Roberts, Dr. R. R	44
Robinson, Theodore	1
Rochester Lamp Co	27
Rochester (N. Y.) Public Schools	6
Rockford Seminary	7
Rogers, W. H	70, 71
Rogers Stamp Co	10, 26
Roger Williams University	8
Rollins College	8
Rolshoven, Julius	2
Rookwood Pottery	20
Rosa, John J	71
Rose Polytechnic Institute	7
Ross, Mary E	73
Roth & Goldschmidt	35
Rothrock, J. P	43
Rottenstein, Dr. J. B	28
Rottenstein & Farley	14
Rowland, Prof	12, 15
Royland Hall School	6
Rudy, Charles	8
Ruggles, Miss Theo. A	3
Rumsey & Co	76
Russell, George H	47
Russia Cement Co	45
Russow Adolph	73
Rust University	8
Rutgers College	8
Ryckman, G. F., Brocton Wine Co	73
Ryder, J. F	12
Ryder, Platt P	1
St. Charles College, Ellicott, Md	8
St. Francis Solanus College, Quincy, Ill	8

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Name.	Class.
St. Ignatius College, Chicago, Ill	8
St. Ignatius College, San Francisco, Cal	8
St. John's College, Annapolis, Md	8
St. Joseph's Diocesan College, Teutopolis, Ill	8
St. Catharine's Hall, Davenport, Iowa	7
St. Lawrence University, Canton, N. Y	8
St. Louis Medical College, St. Louis, Mo	7
St. Louis Seminary, St. Louis, Mo	7
St. Mark's School, Utah	6
St. Mary's College, Marion Co., Ky	7
St. Meinrad's College and Ecclesiastical Seminary, St. Meinrad, Ind	7
St. Paul Despatch Co., St. Paul, Minn	9
St. Paul (Minnesota) Public Schools	6
St. Stanislaus Commercial College, Bay St. Louis, Missouri	6, 7, 8
St. Stephen's College, Annandale, N. Y	8
St. Vincent College, Westmoreland Co., Pa	8
St. Vinteur's College, Bourbonnais Grove, Ill	8
Salomon, R. G	47
Sandusky (Ohio) Public Schools	6
San Joaquin Valley College, Woodbridge, Cal	8
Santa Clara College, Santa Clara, Cal	8
Sargent, Charles S	42, 82
Sargent, John S	1
Sawyer, R. D	1
Schæffer, Prof. C. C	7
Schier, John	76
[illegible]	[illegible]

Name.	Class.
Secretary of Internal Affairs, Harrisburg, Pa	9
Seed Division, U. S. Dept. of Agriculture	71
Seligman, Edw'd	(*)
Sellers, William, & Co	53
Senator Mine	41
Sendker, Alfred H	36
Seth Thomas Clock Co	26
Seven Islands School, New Canton Va	7
Shaler & Hall Quarry Co	41
Sharpe, Clarke & Co	47
Shaw University, Raleigh, N. C	8
Sheffield, L. T	28
Sheldon Art Museum, Middlebury, Vt	7
Shelley, W. H	9
Shepard, H. G., & Sons	60
Shepard, Sydney, & Co	27, 41
Sherwood, Rosina Emmet	1, 2
Shillaber & Co	36
Shirlaw, Walter	1
Shorter College, Rome, Ga	7
Siegel Brothers	35
Silliman, Robert	62
Silver, Burdette & Co	6
Silver & Deming Manufacturing Co	52, 53, 57
Silver King Mining Co	41
Silver Street Kindergarten, San Francisco, Cal	6
Simonds, George Frederic	53
Simmons, Edward Emerson	1
Simpson, L. A	27
Simpson College, Indianola, Iowa	8
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Name.	Class.
Society for the Collegiate Instruction of Women, Harvard University, Cambridge, Mass	8
Sockanosset School for Boys, Howard, R. I	6,7,8
Solar Carbon and Manufacturing Co	62
Solway Process	45
Sonntag, William L	1
Sonoma Wine and Brandy Co	73
South Kentucky College, Hopkinsville, Ky	8
Southern Female College, Petersburg, Va	8
Southwestern Journal of Education	9
Southwestern University, Georgetown, Texas	8
Soulé Commercial College, New Orleans, La	6,7,8
Southern Cotton Oil Co	44,69
Sparks, E. R., Hemp Co	44
Sperry Electric Company	62
Sperry, Elmer A	48
Sphincter Grip Armored Hose Co	45
Sprague Electric Railway and Motor Co	61-62
Spring Hill College, near Mobile, Ala	8
Spurr, Chas. W., Company	42
Stafford, S. S	10
Stamford Seminary, Stamford, N. Y	7
Standard Paint Co	63
Standard Sewing-Machine Co	56
Standard Target Co	38,41
Standenbaur, R	5
Stanley Rule and Level Co	41
Starrett, L. S	53
State Agricultural College, Ames, Iowa	6,7,8
State Agricultural College, Fort Collins, Colo	7
State Board of Health, Mich	9
State Board of Registration of Michigan	9
State Department, Washington, D. C	9
State Department of Education, Harrisburg, Pa	6
State Department of Education, State of Alabama	6
State Department of Public Instruction, Austin, Texas	6
State Department of Public Instruction, Topeka, Kan	6
State Normal School Reports	6
State Primary and Reform School, Boston, Mass	6
State Public School, Coldwater, Mich	6
State School Reports	6
State University of Iowa, Iowa City, Iowa	8
Stearns, J. W	9
Steiner, Samuel	71
Statistical Division, Department of Agriculture	44
Sternbergh, J. H., & Son	58
Stevens Institute of Technology, Hoboken	6,7,8,9
Stetson, John B., Co	36
Stewart, Julius L	1,2
Stiles & Parker Press Co	58
Stokes, Frank Wilbert	1
Stokes, Frederick A., Brother	9
Stone Hill Wine Co	73
Stonewall Claim	41
Story, Julian Russell	1
Story, Waldo	3
Story, Wm. W	3
Story & Fox	10
Straight Line Engine Co	58
Straight University, New Orleans, La	8
Straiton & Storm	44
Stratford Library Association, Bridgeport, Conn	8
Street, S. H., & Co	67
Strickland, Charles Hobart	1
Strickler Brothers & Co	69
Stubbs, Prof. W. C	44
Summers, James Colling	9
Superintendent of Education of Maryland	6
Superintendent of Public Instruction of Colorado	6
Sutherlin Brother	9
Swarthmore College, Swarthmore, Pa	8
Sweetland, H. M	9
Swift & Co	69,70
Syracuse University, Syracuse, N. Y	8
Taber, H	12
Taber, J. W	42
Tabor College	8
Taintor Brothers & Co	9
Talbott, E. H	9
Tanite Company	53
Tapley Machine Co	56
Tarbell, Edmund C	1
Taylor, Thomas, M. D	15,73,*ter*
Temple, Lewis	65
Tenement House Building Co	(*)
Terquem, Emile	9
Thatcher, Edw'd	15
Thayer, Abbott Henderson	1
Thayer Academy	7

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Name.	Class.
Thayer, J. E.	49
The American Baptist Missionary Union.	9
The Bicycling World Co.	9
The Brooklyn Library	6
The Buffalo International Fair Association	9
The California Cackler Co.	9
The Chicago Tribune Publishing Co.	9
The Cultivator Publishing Co.	9
The D. B. Canfield Co., Lim	9
The Engineers' Publishing Co.	9
Theriat, Charles	1
The Forum Publishing Co.	9
The German Singing Circle	9
The Hahneman Medical College.	8
The Harness Gazette Co., Limited.	9
The Helping Hand	9
The Hub Publishing Co.	9
The Indiana Farmer Co.	9
The Inland Publishing Co.	9
The Jewellers' Weekly Publishing Co., New York City	9
The Lehigh University Engineering Society	9
The Lumberman Publishing Co	9
The Lumberman Publishing and Mailing Co	9
The New York College of Physicians and Surgeons	8
The New York Iron Roofing and Corrugating Co.	9
The Packer Collegiate Institute	7
The Power and Transmission Publishing	

Name.	Class.
Tiffany & Co.	10, 11, 19, 23, 24, 26, 29, 37, 41, 43
Tiffany Chemical Company	42, 47
Tillinghast Supply Co.	56
Tinkey, J	5
Time Publishing Co.	9
Tokalon Vineyards, H. W. Crabb	73
Tompkins, Frank H.	1
Torrey, J. R., & Co.	29
Tovey, A. E. J	9
Tower & Lyon	53
Townsend, G. W.	67, 76
Townshend, Chas. Hervey	76
Tracy, John M.	1
Training School for Nurses	(*)
Treasury Department, United States	9
Trenton Watch Co.	26
Trinity College, Hartford, Conn	8
Trinity College, Randolph, N. C.	8
Truesdell, G. S.	1
Trump Brothers Machine Co	53
Tubular Barrow Machine Co	63
Tucker, Carter & Co.	44
Tucker & Carter Cordage Co.	54
Tuft's College.	8
Tuft's Library	9
Tulane University of Louisiana	8
Tupper, Rev. H. M	9
Turner, Charles Y.	1
Turner, L Jackson	63
Tuskaloosa Female College	8
Tuttletown Claim	41

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Name.	Class.	Name.	Class.
United States Signal Service	8, 15, 16	Volk, Douglas	1
Universal Peace Union	(*)	Vonnoh, Rob't William	1
University of California	12, 73	Wabash College	8
University of Dakota	8	Walden, Lionel	1
University of Des Moines	8	Walker, Horatio	1
University of Georgia	8	Walker, J. R	41
University of Illinois	8, 6, 7	Walker, M. Phillip	54
University of Kansas	8	Wallin Leather Co	47
University of Michigan	8, 9	Walsh, James, jr	52
University of New York	8	Waltham Public Library	6
University of North Dakota	8	Ward, Edgar M	1
University of Notre Dame	8	Ward, Everett	45
University of Tenn	8	Ward, Henry	49
University of Pennsylvania	8	Ward, Dr. R. H	7, 73 *ter*
University of Rochester	8	War Department, U. S	9, 36
University of the South	8	Ware, Lewis S	9
University of Vermont and State Agricultural College	8	Warner, Olin L	3
University of Virginia	8	Warner, William R., & Co	45
University of Wisconsin	8	Warner & Swasey	53
University of Wooster	8	Warren, S. Edward	6, 7, 8, 9
University Publishing Co	9	Warren, S. D., & Co	10
Untereiner, Prof. Charles	6	Warren, Andrew	61
Upper Iowa University	8	Warren, Lange & Co	22
Upton, George	45, 53	Warwick Library	8
Ursinus College	8	Washburn College	8
U. S. Bunting Co	32	Washington and Lee University	8
U. S. Bureau of Statistics	(*)	Washington University	8
U. S. Government	42	Waterbury Rubber Co	41, 45
U. S. Coast Survey	16	Waterbury Watch Co	26
U. S. Corps of Engineers	16, 63	Waterman, L. E., Co	10
U. S. Commissioner of Patents	62	Watertown Library Association	6
U. S. War Department	8, 41	Webb, J. Louis	1
Vail, Eugene L	1	Weber, Albert, N. Y	13
Vaile, E. O	6, 9	Weeks, E. L	1
Valentine & Co	45	Weeks & Campbell, N. Y	10
Van Antwerp, Bragg & Co	9	Weir, J. Alden	1, 2
Van Boskerck, Robert W	1	Wellesley College	8
Vanderbilt, J. W	12	Wellington, F	5
Vancouver, Washington	6	Wemple, Jay C., Co	22
Van Dieman, N. H	71	Wentworth Academy	7
Van Nostrand	71	Wesleyan Female College	7
Van Norman Institute	7	Wesleyan University	8
Vassar College	8	Westchester County Institute	6
Vedder, Elihu	1	Western College	7
Varley, Robert	5	Western Electric Co	62
Vermont State Inspector of Finance	9	Western Glass Sign Works	19
Villa Nova College	8	Westinghouse Machine Co	52
Virginia Agricultural and Mechanical College	7	Westminster Seminary	7
Virginia Historical Society	8	Westown School	7
Vizet, V	18, 27, 51	West Virginia Central Railway Co	41
Volta Graphophone Co	62	West Virginia University	8
Vogelsang, L., Sons	9	Wetmore, Chas. A	69, 73
Vogt, August	67, 73	Wettenberg College	8
		Wetzel, John	15
		Wharton, Jos., American Nickel Works	62

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Name.	Class.
Wheaton College	8
Wheaton Female Seminary	7
Wheeler, J. H	71
Wheeler & Wilson Manufacturing Co	56
Wheelock, Jerome	52
White, Betsey Ann	9
White, L. & I. J	41
Whitehouse, Frederick Cope	16, 63
Whiteman, Samuel Edwin	1
White Sewing-Machine Co	56
Whitman, J. A	76
Whitman Agricultural Co	49
Whiton, The D. E., Machine Co	53
Whittemore, William J	2
Whittemore, Geo., & Co	9
Whittock, William	9
Whittredge, Worthington	1
Wickenden, Robert John	1, 2
Wickes Refrigerator Co	74
Wiggins', H. B., Sons	45
Wight, Moses	1
Wilberforce University	8
Wilbur, H. O., Son	72
Wiles, Irving R	1, 2
Wiley, H. W	67
Wiley, John, & Sons	6, 7, 8, 9
Williams, David	9
Williams, The John R., Company	59
Willimantic Linen Co	30
Wilson, James Godfrey	63
Wilson & Roake	52
Winchester Repeating Arms Co	38
Winchen, N. H	16
Witt, J. H	1
Witte, John G., & Brother	63
Wm. Jewell College	8
Woburn Public Library and Schools	6
Wofford College	8
Wogan, A. R., & Co	35
Wolf, Henry	5
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Wood, Thomas Waterman	1
Wood, Ogden	1
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LETTER TRANSMITTING REPORT.

MILL ROCK, NEW HAVEN, CONN., *May* 1, 1889.

SIR: I have the honor to submit herewith my report upon the collection of ores and of statistical information to illustrate, at the Paris Exposition, the variety and extent of the mineral resources of the United States.

Considering the wide geographical distribution of our mineral products and the limited time, and the space in the Exposition at command, it was deemed expedient to rely chiefly upon the presentation of statistical information, and to confine the objective representation to ore samples of moderate size, and to secure them generally from some of the leading producing properties of the country. A general invitation to send specimens was, however, extended to mine owners and mining companies throughout the United States.

In order to arouse attention to this opportunity, and to give information regarding the Exposition, and to secure important exhibits in all of the groups, I visited, at your request, some of the chief mining centers of the Western States and Territories, going to the Pacific coast over the Northern Pacific Railroad through Dakota, Montana, Idaho, Washington Territory, and Oregon, thence through California to San Francisco, and returning by way of Arizona and New Mexico. Invitations to exhibit samples of our mineral products were extended to the public in the name of the Commission through the local journals. There were, however, but few responses and most of the specimens secured are the result of direct personal application and solicitation. The very great expense of the transmission of heavy specimens, or collections of samples, from remote points was a serious bar to the accumulation of a quantity of specimens. In respect of quantity, the collection may be considered as meager in comparison with the extent and variety of our mineral products, but it may serve to exemplify, in part, the statistics of our mineral production, the value of which production last year, in 1888, was the largest in our history and reached the sum of over five hundred and ninety millions of dollars.

Acknowledgments for co-operation in securing specimens for the collection and for statistical information are due specially to Mr. R. C. Chambers, Salt Lake City; Joseph R. Walker and W. F. Hall, Walkerville, Mont.; S. G. Reed, Portland, Oregon;

MINERAL PRODUCTS OF THE UNITED STATES.

GENERAL STATEMENT OF AGGREGATE VALUE ANNUALLY.

The total value of the mineral products of the United States in the year 1887 reached the large sum of $542,284,225. In the year 1888 the value exceeded $590,000,000, as shown in the following table:

Value of the mineral products of the United States for the year 1888.

I.—METALLIC PRODUCTS.

	Quantity.	Value.
Pig iron, spot value ..... long tons..	6,489,738	$107,000,000
Silver, coining value ..... troy ounces..	45,783,632	59,195,000
Gold, coining value ..... do....	1,604,927	33,175,000
Copper, value at New York ..... pounds..	231,270,622	33,333,954
Lead, value at New York ..... tons of 2,000 pounds..	180,555	15,994,951
Zinc, value at New York ..... do....	55,903	5,500,855
Quicksilver, at San Francisco ..... flasks..	33,250	1,413,125
Nickel, at Philadelphia ..... pounds..	195,182	115,518
Aluminum, at Philadelphia ..... do....	19,000	65,000
Antimony, at San Francisco ..... tons of 2,000 pounds..	100	20,000
Platinum, at New York ..... troy ounces..	500	2,000
Total value	.....	256,245,408

II.—NON-METALLIC PRODUCTS.

Bituminous coal ..... tons of 2,240 pounds..	91,106,998	$122,497,341
Anthracite coal ..... do....	41,624,610	89,020,483
Other mineral products	.....	117,396,704
Total value	.....	328,914,528

RÉSUMÉ.

Metals	$256,245,408
Non-metallic mineral products	328,914,528
Mineral products unspecified (estimated)	6,500,000
Total value of all mineral products	591,659,931

Some of the details of production upon which these figures are based will be found in the following pages under the appropriate heads. Free use has been made of the official statistics published annually by the United States,* to which numerous specialists in various parts of the United States are the chief contributors, but the volume for the year 1888 has not yet been printed.

* Issued from the Department of the Interior, "Division of Mining Statistics and Technology," of the United States Geological Survey. Five volumes, commencing in 1883, have been published, the last being for the year 1887.

Value of the Mineral Products

[From the official publication of the Division of Mining

No.	Products.	1882.		1883.	
		Quantity.	Value.	Quantity.	Value.
	Metallic.				
1	Pig-iron, spot value[1] ..... long tons[2] ..	4,623,323	$106,336,429	4,595,510	$91,910,200
2	Silver,[3] coining value ..... troy ounces..	36,197,695	46,800,000	35,733,622	46,200,000
3	Gold, coining value[4] ..... do	1,572,186	32,500,000	1,451,249	30,000,000
4	Copper,[5] value at New York City ..... pounds..	91,646,232	16,038,091	117,151,795	18,064,807
5	Lead, value at New York City ..... short tons..	132,890	12,634,550	143,257	12,322,719
6	Zinc, value at New York City ..... do	33,765	3,646,620	36,872	3,311,106
7	Quicksilver, value at San Francisco ... flasks[6] ..	52,732	1,487,042	46,725	1,253,632
8	Nickel,[7] value at Philadelphia. ..... pounds..	281,616	309,777	58,800	52,920
9	Aluminum, value at Philadelphia. troy ounces..	(8)	.....	1,000	875
10	Antimony, value at San Francisco .. short tons..	60	12,000	60	12,000
11	Platinum, value (crude) at New York City ..... troy ounces..	200	600	200	600
	Total value of metallic products.....	.....	219,755,109	.....	203,128,859
	Non-metallic (spot values).				
12	Bituminous coal[9] ..... long tons..	60,861,190	76,076,487	68,531,500	82,237,800
13	Pennsylvania anthracite ..... do	31,358,264	70,556,094	34,336,469	77,257,055
14	Building stone	.....	21,000,000	.....	30,000,000
15	Lime ..... barrels[12] ..	31,000,000	21,700,000	32,000,000	19,200,000
16	Petroleum ..... do[13]	30,053,500	23,704,698	23,400,229	25,740,252
17	Natural gas	.....	215,000	.....	475,000
18	Cement ..... barrels[14] ..	3,250,000	3,672,750	4,190,000	4,293,500
19	Salt ..... do[15]	6,412,373	4,340,140	6,192,231	4,211,042
20	Limestone for iron flux ..... long tons..	3,850,000	2,310,000	3,814,273	1,907,136
21	South Carolina phosphate rock ..... do	332,077	1,992,462	378,380	2,270,280
22	Zinc-white ..... short tons..	10,000	700,000	12,000	840,000
23	Mineral waters ..... gallons sold..	.....	.....	7,529,423	1,119,603
24	Borax ..... pounds..	4,236,291	338,903	6,500,000	585,000
25	Gypsum ..... short tons..	.....	.....	.....	.....
26	Manganese ore ..... long tons..	3,500	52,500	8,000	120,000
27	Mineral paints ..... do	7,000	105,000	7,000	84,000
28	New Jersey marls ..... short tons..	1,080,000	540,000	972,000	486,000
29	Pyrites ..... long tons..	12,000	72,000	25,000	137,500
30	Flint ..... do	25,000	100,000	25,000	100,000
31	Mica ..... pounds..	100,000	250,000	114,000	285,000
32	Corundum ..... short tons..	500	80,000	550	100,000
33	Sulphur ..... do	600	21,000	1,000	27,000
34	Precious stones	.....	75,000	.....	74,050
35	Gold-quartz, souvenirs, jewelry, etc	.....	75,000	.....	115,000
36	Crude barytes .... long tons..	20,000	80,000	27,000	108,000
37	Bromine ..... pounds..	250,000	75,000	201,100	72,364

of the United States, 1882–1887.

Statistics, U. S. Geological Survey, October 15, 1888.]

1884.		1885.		1886.		1887.		
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
4,097,868	$73,761,624	4,044,525	$64,712,400	5,083,329	$95,195,760	6,417,148	$121,925,800	1
37,744,605	48,800,000	39,910,379	51,600,000	39,445,312	51,000,000	41,269,240	53,441,300	2
1,489,949	30,800,000	1,538,376	31,801,000	1,881,250	35,000,000	1,506,500	33,100,000	3
147,805,407	18,106,162	170,962,007	18,292,999	161,235,381	16,527,651	184,670,524	21,052,440	4
130,897	10,537,042	129,412	10,409,431	135,629	12,067,749	160,700	14,463,000	5
38,534	3,422,707	40,688	3,539,856	42,641	3,752,408	50,340	4,782,700	6
31,913	895,327	32,073	979,189	20,981	1,000,000	33,825	1,129,000	7
64,550	48,412	277,804	191,753	214,992	127,157	205,556	133,300	8
1,800	1,350	3,400	2,550	.....	27,000	.....	74,305	9
60	12,000	50	10,000	35	7,000	75	15,500	10
150	450	250	187	50	100	448	1,838	11
.....	186,426,074	.....	181,599,365	.....	215,864,825	.....	250,419,283	
73,730,530	77,417,066	64,840,668	82,347,648	65,810,676	78,481,056	1978,170,857	98,004,656	12
88,175,756	66,351,512	84,228,548	76,071,948	84,858,077	76,119,130	1137,578,747	84,552,181	13
.....	19,000,000	.....	19,000,000	.....	19,000,000	.....	25,000,000	14
37,000,000	18,500,000	40,000,000	20,000,000	42,500,000	21,250,000	46,750,000	23,375,000	15
24,089,758	30,476,294	21,842,041	19,133,604	28,110,115	30,028,457	28,249,597	18,856,606	16
.....	1,460,000	.....	4,854,200	.....	9,847,150	.....	15,898,500	17
4,000,000	3,720,000	4,150,000	3,492,500	4,500,000	3,960,000	6,692,744	5,186,877	18
6,514,987	4,197,734	7,038,658	4,825,345	7,707,081	4,736,585	7,851,962	4,083,846	19
3,401,330	1,700,965	3,356,956	1,678,478	4,717,163	2,830,297	5,377,000	3,226,200	20
431,779	2,374,784	437,856	2,846,064	490,540	1,872,936	480,558	1,896,818	21
13,000	910,000	15,000	1,050,000	18,000	1,440,000	18,000	1,440,000	22
10,215,328	1,459,143	9,148,401	1,312,845	8,950,317	1,284,070	8,259,009	1,261,473	23
7,000,000	490,000	8,000,000	480,000	9,778,200	488,915	11,000,000	550,000	24
.....	.....	90,405	405,000	95,250	428,625	95,000	425,000	25
10,000	130,000	23,258	190,281	30,198	277,698	34,524	333,844	26
7,000	84,000	3,950	43,575	15,800	285,000	20,000	310,000	27
875,000	437,500	875,000	437,500	800,000	400,000	600,000	300,000	28
35,000	175,000	40,000	220,500	55,000	247,500	52,500	210,000	29
30,000	120,000	30,000	120,000	30,000	120,000	32,000	185,000	30
147,410	398,525	92,000	161,000	40,000	70,000	70,500	142,250	31
60	108,000	60	108,000	645	116,100	600	108,000	32
500	12,000	715	17,875	2,500	75,000	3,000	100,000	33
.....	82,965	.....	69,000	.....	79,056	.....	88,600	34
.....	140,000	.....	140,000	.....	40,000	.....	75,000	35
25,000	100,000	15,000	75,000	10,000	50,000	15,000	75,000	36
281,100	67,464	310,000	89,900	428,334	141,350	199,087	61,717	37
10,900	55,112	13,600	68,000	14,900	74,500	10,200	56,100	38
2,000	35,000	2,700	40,000	2,000	30,000	3,000	40,000	39
.....	.....	357,883	26,231	415,525	33,242	416,000	34,000	40
4,000	20,000	5,000	22,500	5,000	22,500	5,000	20,000	41
2,000	30,000	1,975	24,687	3,000	30,000	2,000	20,000	42
2,000	5,100	68,723	65,353	.....	1436,878	1418,340	18,774	43
.....	.....	1,000,000	15,000	1,160,000	15,000	1,200,000	16,000	44
3,000	10,500	3,000	10,500	3,500	14,000	4,000	16,000	45
1,000	30,000	300	9,000	300	6,000	150	4,500	46
600	2,000	600	2,000	600	2,000	1,000	3,000	47
.....	220,050,674		240,114,544	.....	243,063,083		285,864,542	
.....	186,426,074		181,599,365	.....	215,864,825	.....	250,419,283	
.....	7,000,000	.....	7,000,000	.....	6,000,000	.....	6,000,000	
.....	413,476,748		428,713,909	.....	465,327,908	.....	542,284,525	

[11] The commercial product of anthracite, that is, the amount marketed, was only:

Years.	Quantity.	Value.
1882	29,130,716	$65,530,216
1883	31,734,857	71,324,811
1884	28,178,204	63,400,746
1885	32,805,122	73,811,524
1886	34,178,179	76,901,153
1887	38,537,112	86,708,502

[12] of 200 pounds.

[13] of 42 gallons.

[14] of 300 pounds for natural cement, and 400 pounds for artificial Portland.

[15] of 280 pounds net.

[16] Including cobalt oxide in ore and matte.

[17] Including, except where an amount is specified in the table, fire clay, kaolin, potter's clay, common brick clay, terra cotta, building sand, glass sand, limestone used as flux in lead smelting, limestone in glass making, iron ore used as flux in lead smelting, marls other than New Jersey, gypsum, tin ore, iridosmine, mill buhrstone and stone for making grindstones, novaculite, lithographic stone, talc and soapstone, quartz, nitrate of soda, carbonate of soda, sulphate of soda, native alum, cryolite, mineral soap, strontia, infusorial earth and tripoli, pumice-stone, sienna, umber, zinc white, and mineral waters.

GEOGRAPHIC DISTRIBUTION OF THE MINERAL PRODUCTS OF THE UNITED STATES.

The general geographic distribution of the useful ores and metals of the United States may be said to be coincident with the mountain regions. The meridional extension of the mountain system of America and the many parallel ranges of elevation, each with differences in the rocks and geologic conditions, determine to a great degree a meridional distribution of the ores and metals and a difference in the nature of the ores in the different mountain ranges. In the comparatively modern rocks of the coast ranges of California we find some of the more volatile and soluble minerals—for example, quicksilver, antimony, sulphur, borax, salt, and other chlorides. We have also petroleum and bitumen and a variety of mineral waters.

In the Triassic beds of the Piedmont region of the Sierra Nevada copper sulphides are abundant, and are bordered by the great belt of gold-bearing veins, in which free metallic gold is the characteristic form of occurrence, while the pyrites in association rarely exceeds 2 per cent. Covering the divide of the Sierra Nevada and descending the eastern side silver-bearing veins appear, carrying gold also, but generally alloyed with silver, as in the Comstock lode.

In the region of the Great Basin—the elevated mountainous plateau of the interior—traversed by the ranges of the Humboldt and the Wasatch systems, silver-bearing veins with the usual silver minerals are characteristic, while lead appears in quantity, generally in association with the mountain limestones. In the Rocky Mountain system proper, gold, silver, and lead occur together with the highly pyritic and sulphuretted ores, all better adapted to smelting than to milling.

In the Black Hills of Dakota, where all the geologic formations crop in concentric outcrops around an insular nucleus of ancient Montalban and Huronian schists, nearly all known metals and ores occur, while tin has been found in promising quantities in the ancient rocks.

A new silver lead region has been developed in the northwest along the slopes of the Cœur d'Alenes and beyond the copper and silver region of Montana, now one of the foremost producers of the precious metals. The area of productive mining country is rapidly extending to the northwest, and new smelting establishments are erecting on the Upper Missouri and at Puget Sound.

Alaska is adding to the influx of gold, and large deposits of lead ore and of copper are reported.

At the extreme south the gold and silver lodes of Arizona are receiving increased attention, and many of the silver mines of Mexico are being worked by American capital. Thus gold, silver, copper, and lead are found throughout the western United States from Mexico to the northern boundary and even to the Arctic circle.

Iron ores are also widely distributed, but are not yet utilized to a great extent in the West. A region of enormous beds of magnetite surrounded by a coal region is found in southern Utah, but is not yet worked. The iron ores of the Puget Sound country and of Oregon are beginning to be developed. Michigan, Wisconsin, Mis-

souri, and Minnesota continue to send out enormous quantities of iron ore, and the iron region of Alabama has been rapidly developed.

But the mineral wealth of the country is not confined to the mountain regions. The valleys and the great intermediate plains generally are vast store-houses of coal, petroleum, fuel gas, and salt. Coal abounds in the cretaceous formation of the Rocky Mountains upon both slopes, and affords a superior coke, which is extensively used in the smelting furnaces of the West. In the great Puget Sound country coal is very abundant and of excellent quality.

The construction of transcontinental railways has opened up enormous regions before comparatively inaccessible, and has made it possible to work many mineral districts which, without steam transportation, would lie dormant.

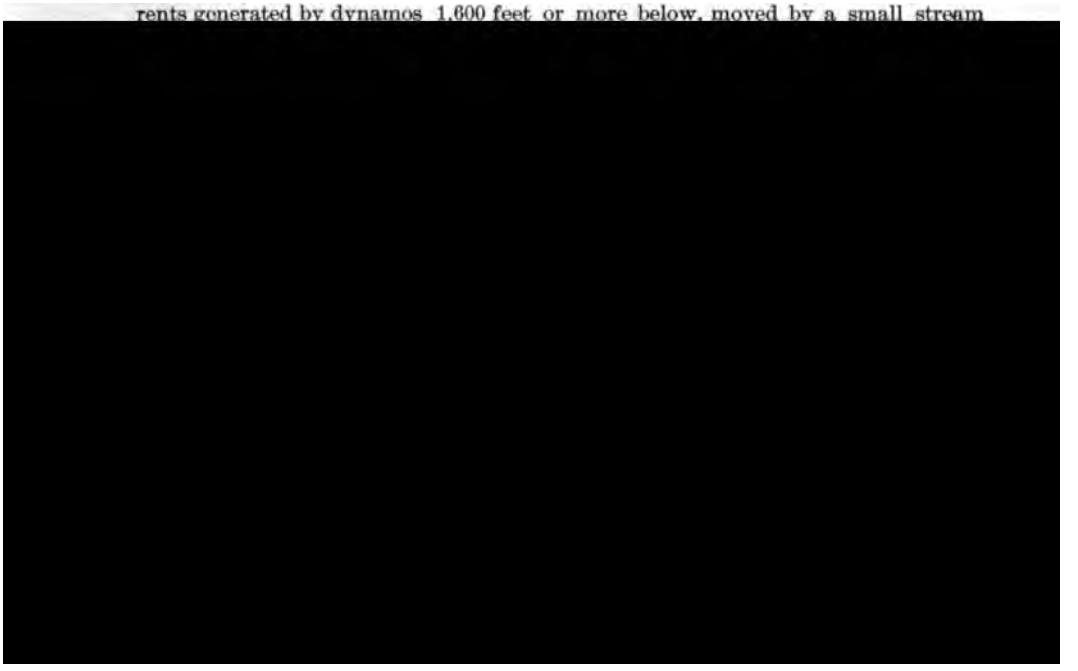
Amongst the more notable metallurgical advances in the United States since the Exposition of 1878, the utilization of natural combustible gas should be especially mentioned. It marks a new era in the history of Pittsburgh and the region to which the gas can be carried in pipes.

The vast system of transportation of petroleum in pipes, even to the sea-board, is extremely interesting and of the utmost industrial importance. The cheaper oils are now used to a considerable extent as fuel. A new oil region has been opened in Colorado, and the oil regions of California are producing.

The extraction of silver by lixiviation has received increased attention, and the process devised by Russell has been introduced at some of the silver mines with marked economy and success.

The American stamp mill has been further improved, and is justly regarded as superior to those of other countries. Such mills are now being introduced in some of the oldest mining centers of Europe, and are being erected under the supervision of American mining engineers. Rock drills, channeling machines for marble quarries, and some forms of automatic concentrating machines have been carried to great perfection and the multiple jaw-breaker for fine crushing worthily supplements the single jaw-crusher of world-wide celebrity for its economy of energy and material.

Great advance has also been made in the transmission of electrical energy to great distances and in the application of this energy to mining work. On the Comstock lode a mill at the surface is successfully run by the power derived from electric currents generated by dynamos 1,600 feet or more below, moved by a small stream



tistician, Mr. John H. Jones; and 763,282 long tons sold to the local trade at the mines (increase, 3,635,558 long tons), valued at $81,977,100 (increase, $5,611,856): all other coals, including bituminous, brown coal, lignite, small lots of anthracite produced in Colorado and Arkansas, and 6,500 tons of graphitic coal mined in Rhode Island, amounting in the aggregate to 94,937,744 short tons (increase, 10,428,744 tons), valued at $115,557,206 (increase, $21,326,454).

"The colliery consumption at the individual mines varies from nothing to 8 per cent. of the total output of the mines, being greatest at special Pennsylvania anthracite mines, and lowest at those bituminous mines where the coal bed lies nearly horizontal, and where no steam power or ventilating furnaces are used. The averages for the different States vary from 2 to 6¼ per cent., the minimum average being in the Pennsylvania bituminous, and the maximum average being in the Pennsylvania anthracite region.

"The total output of the mines, including colliery consumption, was: Pennsylvania anthracite, 41,573,049 long tons (increase over 1887, 4,000,253 long tons), or 46,568,009 short tons (increase, 4,479,893 short tons); all other coals, 98,795,744 short tons (increase, 10,948,384 tons), making the total output of all coals from mines in the United States, exclusive of slack coal thrown on the dumps, 145,363,744 short tons (increase, 15,388,187 tons), valued as follows: Anthracite, $88,714,600 (increase, $4,162,419); bituminous, $119,415,206 (increase, $21,410,550); total value, $208,129,806 (increase, $25,572,969). The above figures show a notable increase in 1888 over 1887 in the aggregate output and value of both anthracite and bituminous coal, although not as great an increase as occurred in 1887 over 1886 in the value of the anthracite, or in the total tonnage of the bituminous coal."

The total production and the spot value in each State and Territory are shown in the following table:

Production of coal in the United States in 1888 *and* 1887.

States and Territories.	1888.		1887.	
	Quantity.	Value at mines.	Quantity.	Value at mines.
Pennsylvania—	*Short tons.*		*Short tons.*	
Anthracite	43,578,000	$84,977,100	30,503,255	$79,365,244
Bituminous	32,500,000	30,875,000	30,866,602	27,800,941
Ohio	11,950,000	11,111,000	10,301,708	9,036,848
Illinois	11,885,188	13,360,000	10,278,820	11,152,586
West Virginia	5,498,800	6,048,680	4,830,820	4,594,979
Iowa	4,842,220	6,304,110	4,473,828	5,991,735
Maryland	3,479,470	3,263,070	3,278,023	3,114,122
Indiana	3,140,959	4,396,350	3,217,711	4,324,604
Missouri	3,000,967	8,650,000	3,360,916	4,258,934
Kentucky	2,570,000	3,084,000	1,933,185	2,233,143
Alabama	2,000,000	3,335,000	1,950,000	2,535,000
Tennessee	1,967,297	2,164,026	1,900,000	2,470,000
Colorado	2,185,477	1,898,049	1,791,735	3,941,817
Kansas	1,850,000	2,775,000	1,500,879	2,235,631
Wyoming	1,480,487	1,811,583	1,170,318	3,510,954
Virginia	1,073,000	1,073,000	825,393	773,360
Washington	1,215,770	3,647,250	772,612	1,699,746
Indian Territory	891,000	1,737,450	685,911	1,296,692
New Mexico	635,042	2,003,887	508,034	1,524,102
Georgia	230,000	345,000	313,715	470,573
Utah	205,000	430,500	180,021	360,042
Arkansas	193,000	289,500	150,000	252,500

Production of coal in the United States in 1888 *and* 1887—Continued.

States and Territories.	1888.		1887.	
	Quantity.	Value at mines.	Quantity.	Value at mines.
	Short tons.		*Short tons.*	
Texas	90,000	$184,500	75,000	$150,000
Michigan	65,000	104,000	71,461	107,191
California	85,000	340,000	50,000	150,000
Oregon	50,000	150,000	31,696	70,000
Dakota	25,000	43,750	21,470	32,205
Montana	41,467	155,501	10,202	35,707
Rhode Island	6,500	17,875	6,000	16,250
Nebraska	1,500	3,375	1,500	3,000
Idaho	600	2,700	500	2,000
Total, exclusive of colliery consumption	138,515,744	200,534,306	124,015,255	174,595,996
Colliery consumption—				
Pennsylvania anthracite	2,990,000	3,737,500	2,581,942	5,186,937
Bituminous, in all States and Territories	3,858,000	3,858,000	3,378,360	3,773,904
Grand total	145,363,744	208,129,806	129,975,557	182,556,837

The chief anthracite coal-fields of the United States are in the State of Pennsylvania, and have an area in the aggregate of less than 500 square miles. The production for the year 1888, shipped by railway and canal, was 38,145,718 long tons, the largest output in the history of the anthracite industry. It has grown to these proportions since the year 1820, when only 365 tons were mined. The production for each year since that time and the aggregate production of the different regions shipped by rail and canal is shown by the table annexed, supplied by the courtesy of the Delaware and Hudson Canal Company, the contributor to the collection of the interesting suite of specimens showing the physical characters of anthracite.

The chemical composition of anthracite from some of the principal beds in each of the chief coal-fields has been determined by Charles A. Ashburner, of the Geo-

ANTHRACITE COAL TRADE OF THE UNITED STATES.

The following table, contributed by the courtesy of the president of the Delaware and Hudson Canal Company, exhibits the quantity of anthracite coal sent to market from the different regions in Pennsylvania, from the year 1820 to 1888, inclusive, together with the annual increase:

Years.	Philadelphia and Reading.	Lehigh Valley.	Delaware and Hudson, Lackawanna	Pittston.	[1]Scranton.	Central Railroad of New Jersey.	Other regions.	Aggregate.	Annual increase.	Aggregate in each period of five years.	Average annual delivery for each period.	Increase in average annual delivery each period over the preceding.	Average gain year by year in each period.
									Tons.				
1820		365						365					
1821		1,073						1,073	708				
1822		2,240						2,240	1,167	19,042	3,808	3,808	761
1823		5,823						5,823	3,583				
1824		9,541						9,541	3,718				
1825	6,500	23,803						34,893	25,342				
1826	16,767	31,280						48,047	13,154				
1827	31,300	32,071						63,434	15,387	335,973	67,195	63,387	12,677
1828	47,284	30,232						77,516	14,082				
1829	79,993	25,110	7,000					112,083	34,567				
1830	80,984	41,750	43,000					174,734	62,651				
1831	81,854	40,966	54,000					176,820	2,086				
1832	209,271	70,000	84,600					363,871	187,051	1,579,809	315,961	248,761	49,752
1833	252,971	123,000	111,777					487,748	123,877				
1834	226,692	106,244	43,700					376,636	[2]				
1835	359,508	131,250	90,000					560,758	184,122				
1836	432,015	118,211	103,861					682,428	121,670				
1837	525,152	223,902	115,387					881,476	199,048	3,683,282	736,656	420,695	84,139
1838	443,875	213,615	78,207					739,293	[2]				
1839	442,608	221,025	122,300				11,930	819,327	80,034				

[1] Scranton in tons of 2,000 pounds, from 1856 to 1876, inclusive.
[2] Decrease.

AL TRADE OF THE UNITED STATES—Continued.

anton.	Central Railroad of New Jersey.	Other regions.	Aggregate.	Annual increase.	Aggregate in each period of five years.	Average annual delivery for each period.	Increase in average annual delivery each period over the preceding.	Average gain year by year in each period.
				Tons.				
.....	.....	15,505	865,414	46,087				
.....	.....	21,463	958,899	93,485				
.....	.....	57,346	1,108,001	149,102	5,827,552	1,165,504	428,848	85,769
.....	.....	68,000	1,263,539	155,538				
.....	.....	127,993	1,631,609	368,130				
.....	.....	188,401	2,021,052	391,783				
.....	.....	205,075	2,343,992	320,940				
.....	.....	299,302	2,982,308	638,317	13,681,132	2,736,226	1,570,722	314,144
.....	.....	256,627	3,089,238	106,929				
.....	.....	308,736	3,242,541	153,408				
.....	.....	276,339	3,254,321	11,780				
.....	.....	415,099	4,377,130	1,122,809				
.....	.....	439,342	4,925,695	548,565	23,425,006	4,685,001	1,948,775	389,755
.....	.....	556,018	5,114,491	188,796				
.....	.....	676,689	5,753,369	638,878				
.....	.....	767,156	6,552,301	798,932				
22,773	.....	906,293	6,751,542	199,241				
32,146	.....	750,556	6,420,342	(2)	33,732,888	6,746,577	2,061,576	412,315
30,950	.....	734,913	6,491,187	70,845				
23,146	.....	981,252	7,517,516	1,026,329				
27,954	.....	987,687	8,131,234	613,718				
07,176	.....	1,068,661	7,474,917	(2)				
09,001	.....	1,223,629	7,481,719	6,802	41,724,795	8,344,959	1,598,382	319,676
06,121	.....	1,289,765	8,704,918	1,223,199				
03,728	.....	1,785,681	9,932,007	1,227,089				

1855	3,735,892	2,040,913	759,699	577,482	734,445	.....	1,640,055	9,488,396	(2)					
1856	4,683,187	2,128,867	1,301,674	535,385	1,519,538	.....	3,309,521	13,418,472	3,930,076					
1857	4,331,830	2,082,410	1,507,487	861,730	1,719,321	.....	2,151,893	12,637,607	(2)	63,668,273	12,733,654	4,388,695	877,739	
1858	4,414,356	2,507,582	1,391,870	953,855	1,728,785	.....	2,618,441	14,214,889	1,577,192					
1859	4,748,969	1,959,523	1,626,391	996,637	1,563,928	.....	3,073,371	13,908,819	(2)					
1860	3,730,403	2,990,878	2,318,073	1,686,008	2,348,097	.....	3,088,921	15,552,380	1,643,561					
1861	5,124,780	2,249,356	2,011,333	801,079	1,916,186	.....	3,507,629	15,610,063	58,283					
1862	5,207,451	3,083,626	2,930,767	1,063,638	2,836,948	.....	5,704,719	20,747,149	5,136,486	93,405,225	18,681,045	5,947,391	1,189,478	
1863	5,209,156	3,382,191	2,752,596	1,239,214	3,135,306	.....	5,970,490	21,689,959	942,810					
1864	4,942,085	3,237,083	2,366,417	1,558,316	2,570,437	.....	5,317,776	19,805,074	(2)					
1865	4,784,504	3,302,042	1,053,817	1,368,506	1,930,648	.....	5,195,291	20,643,509	838,435					
1866	4,935,401	3,772,112	1,997,545	1,086,475	2,054,464	.....	5,060,003	18,906,000	(2)					
1867	6,859,792	4,400,928	1,863,315	1,118,011	[3]2,089,523	2,969,788	1,484,054	30,824,411	1,918,411	103,823,520	20,764,704	2,083,659	416,732	
1868	5,101,045	3,398,717	2,045,041	955,462	[3]2,180,673	2,293,300	1,362,673	17,306,911	(2)					
1869	7,442,617	4,405,958	3,412,063	1,427,159	[3]3,857,404	3,825,553	1,761,944	26,142,689	8,835,778					
1870	5,983,923	4,304,534	3,047,504	1,138,466	[3]3,550,348	3,470,141	1,902,238	23,437,243	(2)					
1871	6,940,283	5,721,870	3,661,792	1,475,389	[3]4,388,969	4,085,423	2,211,363	28,485,080	5,047,837					
1872	7,140,113	5,933,740	3,719,322	1,469,851	[3]4,638,717	4,211,052	2,332,974	29,305,739	820,659	143,739,382	28,747,876	7,988,172	1,596,634	
1873	10,487,003	6,271,773	4,007,218	1,541,145	[3]5,079,123	1,745,399	2,571,366	31,793,027	2,487,288					
1874	[4]11,103,959	5,935,255	3,986,377	1,307,946	[3]5,204,362	(5)	3,030,433	30,718,293	(2)					
1875	[4]11,680,780	6,107,445	4,080,577	1,500,686	[3]4,987,854	(5)	3,280,028	31,637,350	919,057					
1876	[4]11,630,483	6,184,456	4,137,779	1,398,179	[3]5,172,023	(5)	3,553,423	32,136,363	499,013					
1877	7,555,252	5,784,451	5,047,288	1,668,456	[3]6,220,793	4,852,859	3,816,143	34,880,242	2,743,879					
1878	7,175,095	6,502,716	5,596,571	1,624,433	[3]6,996,192	5,742,279	4,418,432	38,145,718	3,265,476					

[1]Scranton, in tons of 2,000 pounds, from 1856 to 1876, inclusive.
[2]Decrease.
[3]Scranton, in tons of 2,240 pounds.
[4]Includes Central Railroad of New Jersey.
[5]Included in Philadelphia and Reading.

The following is a list of contributors and exhibitors:

Delaware and Hudson Canal Company, R. M. OLYPHANT, president Coal and Iron Exchange, New York.

A SERIES OF SAMPLES OF COAL CUT AND POLISHED to illustrate the fracture, color, and density of anthracite:
1 six-inch block, polished on five sides.
1 five-inch block, polished on one side.
1 four-inch block, polished on one side, for paper-weight.
1 five-inch block, polished on top and two sides.
1 double inkstand, turned and polished.
3 single inkstands, turned and polished.
1 turned paper-weight.

The total amount of anthracite coal produced at the mines of this company during the year 1888 was 4,442,638 tons.

West Virginia Central Railway Company, G. W. HARRISON, general traffic agent, Piedmont, West Va

BITUMINOUS COAL from the Elk Garden Mines (14-foot vein).
BITUMINOUS COAL from the Davis Mine (11-foot vein).

Mitchell Vance & Co., Philadelphia, Pa.

COLUMBIA SEMI-BITUMINOUS COAL.

IRON.

The Secretary of the American Iron and Steel Association* estimates the consumption of iron ore in the United States in 1888 in the blast furnaces and Catalan forges and for fettling purposes at 12,650,000 gross tons, against 12,500,000 tons in 1887 and a little over 11,000,000 tons in 1886. (The imports of iron ore in 1888 amounted to 587,470 gross tons. This amount subtracted from the amount consumed would leave 12,062,530 tons as the production of domestic mines in the year 1888, against 11,300,000 in 1887, and 10,000,000 tons in 1886.) The following table shows the

Shipments of iron ore from leading districts.	Gross tons.		
	1886.	1887.	1888.
Tennessee Coal, Iron, and Railroad Company's Inman mines	81,650	102,601	123,159
Alleghany County, Virginia	(*)	150,000	156,126
Preston County, West Virginia	(*)	15,408	13,260
Calhoun, Etowah, and Shelby Counties, Alabama	(*)	120,000	134,932
Total of the above districts	5,977,589	7,773,582	7,620,972

* Statistics not collected.

The same authority reports the production of the leading iron and steel products in 1888 in comparison with the figures for the three preceding years, as follows:

Net tons of 2,000 pounds (except nails).	1885.	1886.	1887.	1888.
Pig-iron	4,529,869	6,365,328	7,187,206	7,268,507
Bessemer steel ingots	1,701,762	2,541,493	3,288,357	2,812,500
Bessemer steel rails	1,074,607	1,703,607	2,354,132	1,552,631
Open-hearth steel ingots	149,381	245,250	360,717	352,036
Open-hearth steel rails	4,793	5,255	19,203	5,261
Crucible steel ingots	64,511	80,609	84,421	78,713
Rolled iron, except rails	1,789,711	2,259,943	2,565,438	2,397,492
Iron rails	14,815	23,679	23,062	14,252
Kegs of cut nails (100 pounds)	6,606,815	8,169,973	6,908,870	6,493,591
Pig, scrap, and ore blooms	41,700	41,909	43,306	39,875

The total production of pig-iron was 7,268,507 net tons, or 6,489,738 gross tons (of 2,240 pounds), the largest yearly production ever attained in the United States. The geographical distribution of the sources of this pig-iron is shown as follows:

States.	Net tons.	States.	Net tons.
Pennsylvania	3,589,186	Georgia	30,397
Ohio	1,103,818	Connecticut	21,644
Illinois	579,397	Colorado	20,877
Alabama	449,492	Maryland	17,606
Tennessee	267,971	Indiana	15,360
New York	257,180	Massachusetts	13,248
Michigan	213,251	Texas	6,587
Virginia	197,396	Maine	5,574
Wisconsin	119,037	Washington Territory	4,063
New Jersey	107,882	Oregon	2,569
West Virginia	95,259	North Carolina	2,400
Missouri	91,783	Total	7,268,507
Kentucky	56,790		

In the eight years since 1880 the Southern States have nearly trebled their production. The number of furnaces in blast at the close of the year 1888 was 332. The total number of furnaces, including those not in blast and erecting, was 589.

The collection is without examples of the important iron-ore producing regions of Michigan, of Missouri, and Wisconsin, or of Alabama and other Southern States.

Chateaugay Ore and Iron Company, Lyon Mountain, New York, EDWARD HALL, assistant general manager.

MAGNETIC IRON ORE and samples of concentrates from the company's mines.

The production of *separated* ore is about 50,000 tons per annum. The leaner ores

carrying about 35 per cent. of iron, yield about one ton of 63 to 65 per cent. ore from each 3 tons treated. It is first crushed small in Blake's multiple jaw crushers and then jigged.

Barnum Richardson Company, Lime Rock, Conn.

LIMONITE IRON ORE, from the "Old Bed," Salisbury, Conn.

This is the ore famous for its production of iron of superior quality in colonial times and to the present time, especially for the manufacture of cast car-wheels.

Dickerson Suckasunny Mining Company.

MAGNETITE IRON ORE, Dickerson Mine, Ferromonte, Morris County, N. J., contributed by Mr. FREDERICK A. CANFIELD.

The Dickerson Mine has been worked since the year 1715. It is now 800 feet deep, and produces 3,000 tons of iron ore a month. The ore is used in the furnaces at Stanhope, N. J., and in many of those on the Lehigh River.

Lincoln Bessemer Company, THOMAS P. MARSHALL, secretary, Trenton, N. J.

MAGNETIC IRON ORE from Oxford Township, Warren County, N. J.

Magnetite-Crystalline, Essex County, N. Y., contributed by W. P. BLAKE.

Interesting by reason of its extreme purity and its highly crystalline formation.

Oregon Iron and Steel Company, Oswego near Portland, Oregon, SIMEON G. REED, president; MARTIN WINCH, secretary; E. C. DARLEY, superintendent.

1. Iron ores, fuel, and flux from the company's mines.
2. Hot-blast charcoal pig-iron.

Puget Sound Iron Company.—JOHN A. PAXTON, president; A. HALSEY, secretary, San Francisco, Cal.

CHARCOAL PIG IRON, made at Port Townsend, Puget Sound, Washington Territory, from magnetite ore in limestone, mined at Texada Island, British Columbia, contributed to the collection by A. HALSEY.

The total potential amount of gold in the United States June 1, 1888 is estimated by the Director of the Mint as worth $706,840,519. The amount used industrially during the period of one year was over $4,103,886, this being the value of the bars manufactured and sold by twenty-six firms.

Big Blue Lode, Sumner Mines, Kern County, Cal.
GOLD ORE, from the Big Blue Lode, contributed by Prof. THOMAS PRICE, San Francisco, Cal.

Boaz Mining Company, Minnehaha, Yavapai County, Ariz., contributor.
GOLD-BEARING ORE, sulphurets and quartz.

Carlisle Gold Mining Company (Limited), Carlisle, Grant County, N. Mex.
GOLD ORE, GALENITE and YELLOW-COPPER PYRITES, in quartz concentrates from the ore. Value per ton: Gold, $32; silver, 13 ounces. Contributed by J. HENRY LONGMAID, general manager.

The Carlisle ore is stated to average a value of $10 in gold and 2½ ounces in silver as stamped. Sixty-eight per cent. of the gold and 6 per cent. of the silver are saved on the copper plates, and also on the Frue vanners in the concentrates 21 per cent. more of the gold and 40 per cent. of the silver. The concentrations contain gold in value $32; silver, 13 ounces; lead, 20 per cent.; copper, 3½ per cent.; zinc, 22 per cent.; and quartz 12 per cent.

Congress Mine, Martinez, Yavapai County, Ariz. Contributed by F. W. MURPHY, superintendent.
GOLD-BEARING PYRITES ORE.

This mine is now shipping this ore to the Prescott sampler. It averages over $100 per ton in value.

Deadhorse Claim, Tuolumne County, Cal.
GOLD-BEARING QUARTZ. Contributed by ALVINZA HAYWARD, Esq.

Deadwood Terra Mining Company.—T. J. GRIER, superintendent, Lead City, Dak.
GOLD ORE. Production in 1888, value, $661,376.97.

Delhi Mine, Nevada County, Cal.
GOLD-BEARING QUARTZ. Contributed by ALVINZA HAYWARD, Esq.

Empire Mill and Mining Company. (*See* Original Empire Mill and Mining Company.)

Grey Eagle Mine, Bayard, Yavapai County, Ariz.
1. GOLD-BEARING ORE—SULPHURETS.
2. GOLD-BEARING ORE—OXIDIZED.

Hart's Mine, Shasta County, Cal.
GOLD-BEARING QUARTZ WITH COPPER PYRITES. Contributed by Prof. THOMAS PRICE, San Francisco, Cal.

Highland Mining Company. T. J. GRIER, general superintendent, Lead City, Dak.
GOLD ORE from the Highland Mine. Value of the production in 1888, $150,895.94.

Homestake Mining Company.—T. J. GRIER, general superintendent, Lead City, Dak.

GOLD ORE AND PHOTOGRAPHS of the mines and mills.

PHOTOGRAPHIC VIEWS: (1) Lead City, Dak.; (2) Homestake works at Lead City; (3) Deadwood Terra mine; (4) Deadwood Terra open cut; (5) Homestake mine; (6) Train of wood and timber coming into Lead City.

The Homestake has been a large producer of gold for many years and has paid a large amount in dividends. The gold-bearing quartz veins traverse ancient pre-silurian schists and are accompanied by porphyritic dikes and overflows. The bullion product from June 1, 1887, to June 1, 1888, was 52,731.11 ounces, valued as follows: Gold, $895,822.37; silver, $7,584.83; from 243,355 tons milled.

Idaho Quartz Mining Company, Grass Valley, Nevada County, Cal.

GOLD-BEARING QUARTZ, showing numerous grains of free gold, from the 1600-foot level of the Idaho mine.

This mine has been a very prosperous one, having been in operation for the past twenty years and produced a total of over $10,000,000 in value of gold, nearly one-half of which has been paid to the shareholders in dividends. The total depth of the incline shaft is 2,696 feet; average width of vein, 36 inches; cost of mining and milling, $8.44 per ton; quantity of ore crushed in 1887, 26,686 tons; quantity of water pumped out per day, 21,600 cubic feet. Mill of thirty-five stamps, 850 pounds each, run by water-power. The ore averages about $20 per ton. The dividends in 1888 were over $300,000.

Lindley, Abel, prospector, Bayard, Yavapai County, Ariz.

GOLD-BEARING COPPER PYRITES from a small undeveloped vein in mica slates.

GOLD-BEARING ORE from the Cleveland lode. (Undeveloped.)

GOLD-BEARING ORE from the Stonewall claim. (Undeveloped.)

Collected at the locality and contributed to the collection.

Montana Company (Limited) (Drum Lummon Mines).—R. T. BAYLISS, superintendent, Ottawa Mining District, Montana.

ton. The property covers 3,000 feet of lode, of which about 2,000 feet is more or less opened and developed. The main shaft is 1,900 feet deep on an incline of about 21 degrees from the horizon. The mill now contains forty stamps, having lately been enlarged. The product in the year 1888 was $334,000 from 17,400 tons of ore. The dividends for the same year aggregated $140,925. The costs are from $10 to $11 per ton. The incorporation has 100,000 shares of a par value of $10.

Original Empire Mill and Mining Company.—JAMES D. HAGUE, president. Grass Valley, Nevada County, Cal.

AURIFEROUS QUARTZ from the Empire Mine.

The Empire Mine, belonging to the Original Empire Mill and Mining Company, one of the oldest mines in the neighborhood of Grass Valley, has produced over $5,000,000 in gold from auriferous quartz, averaging in value about $20 per ton. The mine is 1,800 feet deep on an incline of about 20 to 25 degrees. The vein occurs near the contact of a slate foot-wall and overlying granite. The mill contains forty stamps.

Oto Bella Mining Company, Bayard, Yavapai County, Ariz.: collected at locality by W. P. Blake and presented to the collection by Mr. Long, superintendent.

GOLD-BEARING SULPHURETS in quartz.

GOLD-BEARING OXIDIZED SULPHURETS "free milling."

Plymouth Mine, Amador County, Cal.

GOLD-BEARING QUARTZ (ordinary ore), contributed by A. HAYWOOD, San Francisco, Cal.

The mines of the Plymouth Company are situated in Amador County, Cal., and have been worked to a depth of 1,600 feet. The principal mine consists of an immense chimney of ribbon quartz from 30 to 50 feet wide and 315 to 400 feet long. The quartz mills freely and contains 1 to 2 per cent. of sulphurets. The principal shaft is vertical, with three compartments, and is equipped with superior hoisting machinery. The self-dumping automatic skips have a capacity of 3,000 pounds of rock each. The derrick frame is 76 feet in height, and flat-wire cables are used.

There are two eighty-stamp mills, making one hundred and sixty stamps with a crushing capacity of 400 tons of quartz daily. The average yield per ton of ore in 1886 was $6.18, and in 1887 $7.59. The costs per ton were: Mining, $2.34; milling, 39 cents; saving and reducing sulphurets, 17 cents; general expenses—offices, taxes, and prospecting —17 cents; total average cost per ton, $3.07. The machinery is all run by water-power. The sulphurets are treated by the chlorination process. Total production of the mines to June, 1883, about $2,500,000; since then, $3,804,499. From June, 1883, to January, 1888, over two millions were paid in dividends. The mines were closed in 1888 by reason of fire.

Senator Mine, near Prescott, Ariz.—F. W. MCGOWAN, superintendent, contributor.

1. GOLD-BEARING SULPHURET ORE.
2. GOLD BEARING SULPHURET ORE.

This ore is now shipped to smelting works.

Tuttletown Claim, Tuolumne County, Cal.

GOLD-BEARING QUARTZ, contributed by ALVINZA HAYWARD, esq.

SILVER.

The production of silver in the United States for the year 1888 is valued at $53,152,747. This is for the region west of the Missouri River, exclusive of British Columbia and the west coast of Mexico. The value of the product for each year for the same region since 1870 is reported as follows:*

Annual product of silver, by value, calculated at 1.2929 per ounce.

Years.	Product.	Years.	Product.
1870	$17,330,000	1880	$38,033,055
1871	19,286,000	1881	42,967,613
1872	19,924,429	1882	48,133,039
1873	27,483,302	1883	42,975,101
1874	29,609,122	1884	43,529,925
1875	31,635,229	1885	44,516,599
1876	30,292,924	1886	52,136,851
1877	45,846,109	1887	50,833,884
1878	37,248,137	1888	53,152,747
1879	37,082,857		

The Director of the United States Mint estimates the production of silver for 1888 at 45,783,632 fine ounces, and the total potential amount of silver in the country on the 1st of June as $383,655,537 in value. Over $1,207,467, at its coining value, was used industrially during the year ending June 1, 1888.

The working cost of producing silver in the United States, exclusive of the cost of development of the mines, interest on capital, and amortisation, has been ascertained with great care as nearly as possible by Prof. J. R. Kimball, Director of the United States Mint, who gives the following summarized table † deduced in terms of the relative quantity and market value of the other associated products of the ore-gold and lead.

There are no examples of ores from the Comstock lode in the collection. Specimens are now difficult to obtain, and there are already fine specimens from the Bonanza mines in Paris, the ores that were exhibited in 1878 through the liberality of Mr. Mackay. Although not now in bonanza, some of the mines have been yielding well.

There were thirty-five mines or companies in operation on the Comstock lode in 1888, twelve of them producing bullion. The total yield of the lode was over $5,500,000, and the total bullion production of the State of Nevada was, in round numbers, $9,500,000, a considerable increase above the production in 1887, which was as follows:

Product of gold and silver in Nevada for 1887.

Counties.	Gold.	Silver.	Total.
Churchill	$125.00	$19,875.00	$20,000.00
Douglas	6,000.00	500.00	6,500.00
Elko	8,000.00	366,910.00	374,910.00
Esmeralda	100,000.00	562,500.00	662,500.00
Eureka	500,000.00	943,386.61	1,443,386.61
Humboldt	34,000.00	125,848.75	159,848.75
Lander	.....	358,615.17	358,615.17
Lincoln	3,983.60	34,856.55	38,840.15
Lyon	53,000.00	125,649.50	178,649.50
Nye	3,500.00	334,448.13	337,948.13
Ormsby	.....	1,750.00	1,750.00
Storey	1,719,053.94	2,626,332.41	4,345,386.35
White Pine	110,189.02	206,604.42	316,793.44
Total	2,537,851.56	5,707,276.54	8,245,128.10

The dividends paid for the year amounted to $2,750,000. The Consolidated California and Virginia alone produced over $3,500,000, gross value. The details from the S. F. Report for the last month of the year 1888 will show the general average of the ore and the composition of the bullion:

There were worked at the Morgan mill 4,825 tons of ore, yielding bullion of the assay value of $110,497.97, of which $55,502.53 was gold and $55,994.44 was silver. The average yield of the ore per ton in bullion was $22.90, and the average assay value of the battery samples was $28.27 per ton. There were worked at the Eureka mill 6,370 tons of ore, yielding bullion of the assay value of $149,822.59, of which $77,204.20 was gold and $72,618.39 was silver. The average yield of the ore in bullion per ton, at this mill, was $23.52, and the average assay value of the battery samples was $30.48 per ton. There were worked at both mills a total of 11,195 tons of ore, yielding bullion of the gross assay value of $260,320.56, of which $132,706.73 was gold and $127,613.83 was silver. In addition there was produced from the assay clean-up for 1888 from granulations bullion valued at $1,389.31, and from ashes, sweepings, and slag bullion valued at $5,921.37, making a grand total of $267,631.27 produced and shipped for the fiscal month just ended. The average yield of the ore in bullion per ton was $23.25, of which $11.85 was gold and $11.39 was silver. The average assay value of the battery samples was $29.53 per ton. It is worthy of note that the proportion of gold contained in the Consolidated California and Virginia bullion produced last month exceeded that of the silver.

The total production of silver and gold of the Comstock lode has been made the subject of careful study by Alfred Doten, of Virginia City, Nev.,* who gives

* *Vide* Report on the Production of Gold and Silver by the Director of the United States Mint, 1887. Washington, 1888.

the following tabular statement. The sources of the figures given are the records of some of the leading representative companies; also the assayers' percentages, and information and data furnished by observant witnesses and competent authorities.

Gold and silver production of the Comstock lode from commencement of operations.

Years.	Gold.	Silver.	Total.	Years.	Gold.	Silver.	Total.
1859 *a* ..	$30,000.00	.....	$30,000.00	1875 *e* .	$15,4 5,312.93	$10,330,208.61	$25,825,521.54
1860 *a* ..	525,000.00	$225,000.00	750,000.00	1876 *e* ..	18,971,196.12	12,647,464.08	31,618,660.20
1861 *a* ..	2,450,000.00	1,050,000.00	3,500,000.00	1877 *e* ..	21,780,922.02	14,520,614.68	36,301,536.70
1862 *a* ..	4,690,000.00	2,010,000.00	6,700,000.00	1878 *e* ..	11,796,838.46	7,864,555.65	19,661,394.11
1863 *b* ..	7,440,000.00	4,960,000.00	12,400,000.00	1879 *e* ..	4,202,091.49	2,801,394.33	7,003,485.82
1864 *b* ..	9,600,000.00	6,400,000.00	16,000,000.00	1880 *f* ..	3,077,409.00	2,051,606.00	5,129,015.00
1865 *c* ..	7,700,231.90	5,183,487.93	12,883,719.83	1881 *f* ..	645,372.00	430,248.00	1,075,620.00
1866 *c* ..	8,944,736.51	5,963,157.67	14,907,894.18	1882 *f* ..	1,046,078.40	697,385.60	1,743,464.00
1867 *b* ..	8,243,170.80	5,495,437.20	13,738,608.00	1883 *f* ..	1,203,809.30	802,539.53	2,006,348.83
1868 *b* ..	5,087,861.40	3,391,907.60	8,479,769.00	1884 *f* ..	1,561,313.60	1,277,438.40	2,838,752.00
1869 *b* ..	4,443,346.80	2,962,231.20	7,405,578.00	1885 *f* ..	1,729,531.25	1,415,071.04	3,144,602.29
1870 *d* ..	5,222,595.24	3,481,730.16	8,704,325.40	1886 *f* ..	2,054,920.15	1,681,298.31	3,736,218.46
1871 *e* ..	6,149,717.19	4,099,811.46	10,249,528.65	1887 *f* ..	2,481,176.85	2,030,053.78	4,511,230.63
1872 *e* ..	7,341,839.79	4,894,559.86	12,236,399.65	Total.	190,403,729.41	126,276,706.56	316,680,435.97
1873 *e* ..	13,003,187.12	8,668,791.41	21,671,978.53				
1874 *e* ..	13,496,071.09	8,990,714.06	22,476,785.15				

a From Corey, Paul, and Harris, three of the first quartz-mill men on Gold Cañon.

b From J. D. Hague's Report on Mining Industry of the Fortieth Parallel, 1870, competently corroborated.

c From the records of Wells, Fargo & Co.'s Express.

d From official mining data, corroborated and added to by trustworthy information.

e From sworn quarterly statements of mining companies to the assessor for bullion tax purposes.

f From the official records of mining companies, furnished by secretaries.

It is claimed to be more complete and accurate than the figures based on the re-

Assessments and dividends on the Comstock lode to January 1, 1888.

Names of mines.	Assessments.	Dividends.	Names of mines.	Assessments.	Dividends.
Utah	$800,000		Confidence	$43,000	$78,000
Union Consolidated	2,270,000		Yellow Jacket	5,448,000	2,184,000
Sierra Nevada	6,050,000	$102,500	Kentuck	342,000	2,005,970
Mexican	2,015,700		Crown Point	2,673,370	11,588,000
Ophir	4,115,700	1,595,800	Belcher	2,614,000	15,397,200
Consolidated California and Virginia	2,052,000	75,572,800	Overman	3,737,180	
Best & Belcher	1,953,700		Caledonia	3,155,000	
Gould & Curry	4,197,000	3,826,800	Justice	3,491,500	
Savage	6,542,000	4,460,000	Consolidated Bowers, and adjacent small Gold Hill mines		4,800,000
Hale & Norcross	5,086,800	1,598,000	Total	67,418,760	126,719,070
Chollar and Potosi	2,009,600	3,080,000	Excess of dividends over assessments		59,300,310
Bullion	3,957,000				
Exchequer	750,000				
Alpha	510,000				
Consolidated Imperial	1,775,000	500,000			
Challenge	30,000				

This shows at a glance how unequally the paying ore was distributed along the course of the great lode. The Bullion mine, for example, in the center of the lode, made no return for the sum of nearly four millions of dollars expended in a vain search for ore. So also the Sierra Nevada mine returned only $102,500 in dividends for the six millions and over expended there.

The sources of the silver and gold product of the United States during the fiscal year 1887, ending June 1, 1888, stated geographically by States and Territories, were approximately as shown by the table in the Appendix.

Alice Gold and Silver Mining Company, Walkerville, Mont.—JOSEPH R. WALKER, president; WILLIAM E. HALL, superintendent.

SPECIMENS OF SILVER ORE from various parts of the lode.

These specimens show the nature of the ore and veinstone of a group of lodes traversing the granite formation of Butte, Mont. (For a description in detail, *see* Trans. Amer. Inst. Mining Engrs., vol. xvi, p. 65.) The ore consists largely of iron pyrite, blende, and galena. In 1887 the average value of the ore per ton, as determined by working, was: Gold, $1.34; silver, $28.23; total value, $29.57. The ore is first roasted and chlorodized and is then amalgamated in pans. The mine is worked to a depth of 1,000 feet. The costs in 1886 were for mining, $7.44 per ton, for milling, $7.57, making a total of $15.01 for mining and milling, irrespective of dead-work and improvements to plant and general expenses. During the period of fifteen months to January 1, 1889, 14,529 tons of ore were worked, producing bullion valued at $461,127.92. The average per ton saved in gold was $1.97+, and of silver $29.18+; total per ton, $31.46+. The average percentage of loss in tailings was 3.38 ounces.

The weight of each pan charge is 3,800 pounds. The chlorination averaged 88.29 per cent.; the amalgamation, 87.66 per cent.; loss of quicksilver per ton of ore reduced, 0.95 of a pound. Cost of salt, $11.26 per ton.

Cactus Mining Company.—WILLIAM L. LAY, agent, Frisco, Beaver County, Utah.

SILVER AND COPPER ORES from the company's mines.

Comfort Consolidated Mining Company.—T. H. WHEELER, president; S. COMFORT, treasurer.

GOLD AND SILVER ORE from Rocky Bar, Idaho.

Daly Mining Company.—R. C. CHAMBERS, superintendent, Park City, Summit County, Utah.

SERIES OF SPECIMENS OF THE ORES of the mine from all the principal levels. Silver, gold, and lead.

This mine is opened upon the western extension of the Ontario Silver Mining Company's ground, 2½ miles south of Park City. The shaft is 800 feet deep, and the mine is drained to that depth by the Ontario drain tunnel. The top of the Daly shaft is 200 feet higher than the Ontario shaft. The best or highest grade of ore carrying lead and other metals is selected out and sold to smelting works. The lower grades of ore are treated by the mill processes at the mine. The expenses per ton, 1886–1887, are officially reported as follows:

	Net tons.	Per ton.	Total expense.
Extraction	22,088	$5.03	$111,055.01
Hauling	14,325	.88	12,670.50
Reduction	12,858	11.55	148,530.57
Sundries	22,088	4.66	103,009.81
Prospecting	22,088	4.50	99,429.37
Operating expenses		26.62	474,695.26

The ore sold to smelters (7,704 tons) averaged $81.30 per ton, the ore milled (12,858 tons) averaged $44.15, and the tailings $4.41.

In the year 1888 the production was as follows:

	Tons.	Net value.
Ore crushed	21,000	$803,000
Ore shipped	2,500	197,000
Total	23,500	1,000,000

a capacity of about 65 tons per day; 160 men are employed in and about the mine and mill. The production of the mine for the year 1888 was 749,883 ounces of silver and 7,224 ounces of gold from 24,594 tons of ore.

Ontario Silver-Mining Company.—R. C. CHAMBERS, superintendent, Park City, Summit County, Utah.

SERIES OF SAMPLES OF ORE containing silver, gold, and lead, from the different levels of the mine from the 200-foot level to the 1,000-foot level.

This mine has been worked to a depth of 1,000 feet, and for a distance on the vein of over 4,000 feet. The main chute of ore opened by the principal workings measures over 2,600 feet horizontally. The mine is drained by an adit to a depth of 600 feet. A new drainage tunnel is in progress from the east side of the mountains, intended to drain the lode to a depth of 1,400 feet. This will be about 14,000 feet long, and will require several years for its completion.

The production of the mine in 1887 was 1,728 bars of silver bullion, weighing 1,068,983.50 ounces fine silver, valued at $1,018,706.57, besides ore and concentrate sold, netting $1,794,192.08. The average silver content of the ore raised was 47.4 ounces. The tailings contained 4.26 per cent. Extraction by amalgamation, 91 per cent. The total cost of the production per ton was $24.97, distributed as follows:

	Net tons.	Total cost.	Cost per ton.
Extraction	34,000	$245,960.99	$7.24
Sundries	34,000	79,498.07	2.33
Prospecting	34,000	149,058.62	4.38
Reduction	24,427	228,847.76	9.37
Bullion expense	24,427	25,837.78	1.06
Hauling to mill	23,325	13,743.24	.59
Total		742,946.46	24.97

According to the Salt Lake Tribune, the product of the mine for 1888 was:

	Tons.	Value.
Ore crushed	25,000	$980,000
Ore shipped	7,700	750,000
Total	32,700	1,730,000

The number of the men employed at the mine was 350, and at the mill 75. No. 3 shaft was sunk to a depth of 1,200 feet. This company has paid over $10,000,000 in dividends to the shareholders.

Silver King Mining Company, Mines at Silver King, Pinal County, Ariz.—JOSEPH NASH, secretary, San Francisco, Cal. Contributor by request.

SILVER ORE from the company's mine. Four samples.

SILVER ORE, concentrates sample as shipped. Assay value $815 per ton of 2,000 pounds.

Lent by W. P. BLAKE.

STROMEYERITE (Silver-copper glance.) MASSIVE SPECIMEN associated with HEAVY SPAR.

Contains about 51 per cent. of silver and 30 per cent. of copper. Specific gravity 6.22. For a theory of composition and association see "Description of the Silver King Mine of Arizona," by W. P. Blake, page 29.

The Silver King Mine, in Arizona Territory, about 1,000 miles from San Francisco, is remarkable for its yield of silver ores without gold. Native silver, argentite, stromeyerite, argentiferous blende, and argentiferous galena are the principal species. The veinstone is quartz and barite. The property affords also one of the few examples of mechanical concentration of silver ore preparatory to its reduction. In this instance the ore as it is raised from the mine is first broken in a Blake crusher, then stamped and passed over Frue tables. The concentrate, as shown, is shipped in sacks to San Francisco. The vein formation is peculiar and variable. The production has been large, and nearly $2,000,000 have been paid in dividends, but at present the ore supply is insufficient to keep the mill running, and prospecting is in progress. Depth of workings 900 to 1,000 feet.

COPPER.

The following tabular summary* shows the production and sources of copper in the country from 1882 to 1887 inclusive.

Copper production of the United States.

	1882.	1883.	1884.	1885.	1886.	1887.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Lake Superior	56,982,765	59,702,404	69,353,202	72,148,172	79,890,798	75,471,890
Arizona	17,984,415	23,874,963	26,734,345	22,706,366	15,657,035	17,730,462
Montana	9,058,284	24,664,346	43,093,054	67,798,864	57,611,621	78,699,677
New Mexico	869,489	823,511	59,450	79,839	558,385	283,664
California	826,695	1,600,862	876,166	496,028	430,210	1,600,000
Colorado	1,494,000	1,152,652	2,013,125	1,146,460	409,306	2,012,027
Utah	605,880	341,885	265,526	166,199	500,000	2,500,000
Wyoming	100,000	962,468				
Nevada	350,000	288,077	100,000	8,871	50,000	
Idaho			46,667	40,381		
Middle States	294,695	324,706	232,114	190,000		
New England	1,555,000	612,194	904,423	211,602	315,719	900,000

Copper production of Lake Superior mines.

	1887.	1888.		1887.	1888.
	Pounds.	*Pounds.*		*Pounds.*	*Pounds.*
Calumet and Hecla	46,016,128	50,402,000	Huron	1,484,103	2,360,552
Quincy	5,603,691	6,501,000	Ridge	84,902	51,000
Osceola	3,574,972	4,130,085	Wolverine	2,300	
Franklin	3,915,898	3,622,003	Tamarack	7,396,529	11,411,395
Allouez	895,010	350,000	Kearsarge	21,237	831,856
Atlantic	3,741,865	4,000,000	Evergreen		41,000
Central	2,199,133	1,800,000	Tributers, etc	50,000	79,089
Mass		71,000	Total	75,471,890	86,850,000
Copper Falls	560,000	1,200,000			

Copper production of Arizona.

	1884.	1885.	1886.	1887.	1888.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Copper Queen	7,700,000	6,721,585	3,800,000	5,945,550	9,379,949
Old Dominion	7,400,000	4,088,640	4,567,665	1,444,770	4,870,000
Arizona Copper	3,760,000	6,832,880	5,250,000	5,714,000	7,133,186
Detroit	2,940,000	3,456,000	2,135,000	4,404,321	5,420,234
United Verde	3,680,000			272,144	3,200,000
Other mines	1,254,345	1,007,301			3,196,639
Total	26,734,345	22,706,366	16,000,000	17,790,000	33,200,000

Copper production of Montana.

	1884.	1885.	1886.	1887.	1888.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Anaconda	23,000,000	36,000,000	33,267,864	57,000,000	63,245,473
Parrot	9,300,000	9,800,000	10,000,000	10,000,000	10,750,000
Boston Montana	6,000,000	7,500,000	500,000	1,500,000	18,273,607
Liquidator			1,500,000		
Clark's	600,000	10,000,000	7,000,000	7,100,000	700,000
Butte Reduction Works	2,000,000	2,500,000	1,700,000	1,565,000	3,521,565
Williams		1,300,000	2,000,000	1,500,000	*1,488,000
All others	1,593,054	798,864	1,643,621		521,295
Total	43,093,054	67,798,864	57,611,485	78,700,000	98,500,000

*The Colorado Smelting and Mining Company.

SUMMARY.

	Pounds		*Pounds.*
Lake Superior	86,850,000	Domestic production	231,000,000
Arizona	33,200,000	From imported ores	5,000,000
Montana	98,500,000		
New Mexico	2,000,000	Total production	236,000,000
Colorado	3,000,000	Stocks, December 31 1888	40,000,000
Utah	2,500,000	Available supply	276,000,000
All other sources	1,950,000		
Deduct exports in ore, matte, ingots, etc		78,000,000	
Consumption in 1888		120,000,000	
Stocks on hand December 31, 1888			198,000,000
			78,000,000

The quantity of electrolytic copper produced was about 17,000,000 pounds.

In regard to the imports and exports of copper the Engineering and Mining Journal says:

"From official data we get the exports of copper for eleven months from all parts of the United States, and we have added the exports for December from the port of New York. We have carefully estimated the copper in ore, matte, etc., exported, and thus estimate the total exports as about 78,000,000 pounds. The imports were mostly in ore, which produced, as already stated, 5,000,000 pounds of copper."

United States copper imports.

Years.	Bars, ingots, and pigs.		Old, fit only for re-manufacture.		Fine copper contained in ores.		Regulus and black copper.*	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Pounds.		*Pounds.*		*Pounds.*		*Pounds.*	
1867	1,635,953	$287,831	569,732	$81,930	.....	$936,271	.....	.....
1868	61,394	6,935	318,705	42,652	3,496,994	197,208	.....	.....
1869	13,222	2,143	290,780	34,820	24,960,604	448,487	.....	.....
1870	5,157	418	255,386	31,931	1,936,875	134,736	.....	.....
1871	3,316	491	369,634	45,672	411,315	42,453	489	$60
1872	2,638,589	578,965	1,144,142	178,536	584,878	69,017	4,247	1,088
1873	9,697,608	1,984,122	1,413,040	255,711	702,086	80,132	1,444,239	279,631
1874	713,935	134,326	733,326	137,087	606,266	70,633	28,880	5,397
1875	58,475	10,741	396,320	55,564	1,337,104	161,903	12,518	2,076
1876	5,281	788	239,987	35,545	538,972	68,922	8,584	1,618
1877	230	30	219,443	28,608	76,637	9,756	1,874	260
1878	1	.....	198,749	25,585	87,039	11,785	.....	.....
1879	2,515	352	112,642	11,907	51,959	6,199	.....	.....
1880	1,242,103	206,121	195,255	91,234	1,165,283	173,712	2,201,394	337,163
1881	219,802	36,168	541,074	63,383	1,077,217	124,477	402,640	51,633
1882	6,200	836	508,901	59,629	1,473,109	147,416	224,052	30,013
1883	.....	.....	330,495	36,166	1,115,386	113,349	.....	.....
1884	542	107	149,701	12,099	2,204,070	219,937	2,086	204
1885	914	179	81,213	6,658	2,005,720	242,702	285,382	30,807

Copper exported from the United States—Continued.

Fiscal years ending June 30.	Ore.		Pigs, bars, sheets, and old.		Value of manufactured.	Total value.
	Quantity.	Value.	Quantity.	Value.		
	*Cwts.		Pounds.			
1877	21,432	109,451	13,461,553	2,718,213	195,730	3,023,394
1878	32,947	169,030	11,297,876	2,102,455	217,446	2,488,921
1879	23,070	102,152	17,200,730	2,751,153	79,900	2,933,205
1880	21,023	55,703	4,206,258	667,242	126,213	849,218
1881	9,958	51,499	4,865,407	786,800	38,036	876,395
1882	25,936	89,515	3,340,531	565,295	93,646	748,456
1883	112,923	943,771	8,221,363	1,293,947	110,286	2,348,004
1884	386,140	2,930,895	17,044,760	2,527,829	137,135	5,595,859
1885	432,300	4,739,601	44,731,858	5,330,887	107,536	10,187,024
1886	544,020	3,068,879	24,202,393	2,493,898	108,971	5,671,748
1887	307,283	1,693,879	19,735,696	1,947,900	85,623	3,727,402
1888	754,430	6,500,000	31,425,754	4,871,647	120,374	11,492,021

*One hundred and twelve pounds.
†Evidently errors in quantities.

Average price per pound (in cents) of Lake copper at New York.

Year.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1860	23⅛	23⅛	23⅛	23⅛	22⅛	22⅛	21⅛	21⅛	21⅛	21⅛	20⅛	20	22⅛
1861	19⅛	19⅛	19⅛	19⅛	19⅛	18⅛	17⅛	18⅛	19⅛	20⅛	21⅛	24⅛	19⅛
1862	27⅛	26⅛	24	22⅛	21⅛	21⅛	23⅛	24⅛	25⅛	29⅛	31⅛	31	25⅛
1863	33	36	34	30⅛	30⅛	30⅛	30⅛	30	31⅛	33⅛	36⅛	38⅛	32⅛
1864	40⅛	41⅛	42	43⅛	43⅛	46⅛	50⅛	51⅛	50	47⅛	48	49⅛	46⅛
1865	48⅛	45	50⅛	34⅛	32	29⅛	29⅛	31⅛	31⅛	32⅛	39⅛	42⅛	36⅛
1866	40	36⅛	32⅛	29⅛	29⅛	32⅛	32⅛	30⅛	31⅛	30⅛	28⅛	27⅛	31⅛
1867	28⅛	27⅛	25⅛	24	24⅛	24⅛	25	26	26⅛	24⅛	22⅛	22⅛	25⅛
1868	22⅛	23⅛	23⅛	23⅛	24⅛	23⅛	23⅛	24⅛	23⅛	23⅛	23⅛	24⅛	23⅛
1869	25	26⅛	25⅛	23⅛	24	22⅛	22	22⅛	22⅛	22⅛	22⅛	21⅛	23⅛
1870	21⅛	20⅛	19⅛	19⅛	19	19⅛	20⅛	20⅛	21⅛	21⅛	22⅛	22⅛	20⅛
1871	22⅛	21⅛	21⅛	21⅛	21⅛	21⅛	22⅛	22⅛	23⅛	25⅛	24⅛	26⅛	22⅛
1872	27⅛	28⅛	33	41⅛	36⅛	33⅛	33⅛	33⅛	33⅛	32⅛	31⅛	32⅛	33
1873	34⅛	34⅛	34⅛	33⅛	31⅛	29⅛	27⅛	27⅛	26	23⅛	22⅛	24⅛	29
1874	24⅛	24⅛	24⅛	24⅛	24⅛	24⅛	21⅛	20	21⅛	21⅛	21⅛	23⅛	23⅛
1875	22⅛	22⅛	21⅛	21⅛	21⅛	22⅛	22⅛	23	23⅛	23⅛	23	23⅛	22⅛
1876	23⅛	22⅛	22	22	21⅛	20	19⅛	19	20	20⅛	20⅛	19⅛	21
1877	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19	18⅛	18	17⅛	17⅛	17⅛	18⅛
1878	17⅛	17⅛	17	16⅛	16⅛	16⅛	16⅛	16⅛	16	15⅛	15⅛	15⅛	16⅛
1879	15⅛	15⅛	15⅛	15⅛	16	16⅛	16	16⅛	16⅛	19⅛	21⅛	21⅛	17⅛
1880	21	21⅛	21⅛	23⅛	19	18⅛	18⅛	19	18⅛	18⅛	18⅛	19	20⅛
1881	19⅛	19⅛	19⅛	18⅛	18⅛	17	16⅛	16⅛	17⅛	18⅛	18⅛	19⅛	18⅛
1882	20⅛	19⅛	19	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18	18	18⅛
1883	18	17⅛	17⅛	15⅞	15⅛	15⅛	15	15	15⅛	15⅛	15	14⅛	15⅛
1884	14⅛	14⅛	14⅛	14⅛	14⅛	14⅛	14	13⅛	13⅛	13	12⅛	11⅛	13⅛
1885	11⅛	11⅛	10⅛	11	11⅛	11⅛	11⅛	11⅛	11⅛	11	11	11⅛	11⅛
1886	11⅛	11⅛	11⅛	11⅛	10⅛	10	10	10	10⅛	11⅛	12	12	11
1887	11⅛	11	10⅛	10⅛	10	10	10⅛	10⅛	10⅛	10⅛	12⅛	17	11⅛
1888	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	17⅛	16⅛	16⅛	16⅛	16⅛

Prices of Chili bars in pounds sterling per ton of 2,240 pounds.

Year.	Stocks.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.	Year.
	Tons.													
1866.....	29,388	95	93	88	86	80	83	79	74	83	80	75	72½	82½
1867.....	32,084	70	76	74	71	71	73	70½	68	73½	68½	68	69½	71½
1868.....	33,500	67	69½	71	73½	77½	77	75	68½	68	67	69	69	71
1869.....	41,921	73½	73½	72½	71	70½	68	67½	68	68½	67½	67½	66½	69½
1870.....	43,365	66½	66½	66½	65½	67½	67½	68½	63½	63½	63½	62½	62½	65½
1871.....	40,032	64½	63½	64½	64½	65½	67½	68½	68½	67½	68½	68	76	67½
1872.....	36,497	86½	85	83½	99½	101	107½	103	102	91	83½	86	84½	92½
1873.....	41,082	91	87½	8	91	88½	84½	80½	81½	84½	83	83½	83½	85½
1874.....	36,868	83½	81½	77	75	74	74	78	76	77½	80	83½	83½	78½
1875.....	36,316	84	83	82	80	83	83	82	79	82½	82½	82	87½	82½
1876.....	36,962	81½	81	76½	77½	79½	77½	74½	72½	71½	72½	76½	81	76½
1877.....	42,313	76½	73	71½	70½	68½	69	69	69	67½	65½	65½	76½	70½
1878.....	48,399	65½	65½	63	63	62	64½	64	61½	61½	60	57½	63½	62½
1879.....	57,837	58	56	54½	56	56	55	56	53½	54½	58½	66	58½	58½
1880.....	62,855	65½	73½	70½	65½	60	56½	60	61	61½	61½	61	66½	63½
1881.....	58,149	61½	62	61	61	59	59	58½	59	59	62½	63½	67	61½
1882.....	49,696	71	64	64	64½	63½	63½	67	68½	67½	71	69	66½	67
1883.....	40,878	65	65	65	64½	62½	63½	64	63½	64	63	61½	59½	63½
1884.....	45,880	56½	55½	53½	56½	56	54½	55	53½	54½	52½	51½	47½	53½
1885.....	55,939	48½	47½	46½	44½	44½	44½	44½	43½	41½	39½	41½	41½	44
1886.....	61,741	40½	40½	42½	41½	40½	39½	39½	39½	40½	41½	40½	39½	40½
1887.....	42,301	38½	39½	39½	39½	39½	40	40	40½	39½	44½	66½	75½	45½
1888.....	104,000	85	77½	78½	80½	80½	80½	81	80½	89	100	78½	77½	82½

Anaconda Mining Company, Butte City, Mont.—J. B. HAGGIN, president; MARCUS DALY, superintendent.

COPPER ORE AND PRODUCTS from the company's mine at Butte City and the smelter at Anaconda.

COPPER ORE—First-class smelting ore.

Daly has always been the manager. Both mines have a three-compartment shaft the former 1,000 feet and the latter 680 feet deep. On all levels between third and eighth the two mines are connected, and some stoping has been done, but nothing to be compared with the vast field yet to be worked. There are miles of drifts and cross-cuts tapping ore bodies which vary in size, but which have an average of 50 feet in width for a distance of 3,000 feet. The double hoisting engines are 20-inch cylinder and 60-inch stroke. Each roll carries 1,500 feet of steel-wire cable and has carrying capacity of 2,000 feet. Two No. 10 Burleigh air-compressors furnish air and drive the forty-two 3-inch and 17½-inch drills. They have ten pumps in use for draining mine. Fifty thousand feet of timber are used a day for timbering mine. The average width of vein is 50 feet, and as depth is reached there has been an increase. There are on dump of mine 100,000 tons. During year 600,000 tons have been shipped. The matte shipped from smelters during year has been 120,000,000 pounds. Eight hundred men are employed in and about the mine."

It is reported also that the smelter, mills, and mines represent an investment of $20,000,000. With the new plant at Anaconda, recently partly destroyed by fire, it was expected to be able to crush and concentrate 2,500 tons of ore a day.

Bristol Copper and Silver Mining Company.—E. G. HUBBEL, manager, Bristol, Conn.

VARIEGATED COPPER ORE.
YELLOW COPPER ORE.
YELLOW COPPER ORE AND QUARTZ.
PURPLE COPPER ORE AND GANGUE.

Cactus Mining Company. WILLIAM L. LAY, agent, Frisco, Beaver County, Utah.

COPPER AND SILVER ORES from the mines of the company.

Copper Basin Mining Company, Copper Basin, near Prescott, Ariz. Collected at the locality by W. P. BLAKE, and presented to the collection by Mr. WILLIAMS, superintendent.

COPPER ORE, MALACHITE IN SANDSTONE.
COPPER ORE, MALACHITE IN CONGLOMERATE.
COPPER ORE, MALACHITE, AND AZURITE deposited in bowlders.
GRANITE, containing YELLOW COPPER ORE.

These ores are especially interesting for the manner of their origin. They are evidently the result of the infiltration from above of cupriferous solutions derived from decomposing copper pyrites disseminated in the subjacent granite. The copper carbonate appears as a superficial coating upon the grains and pebbles which constitute 80 per cent. and over of the weight. The deposit throws light upon the origin of other and somewhat similar deposits of copper in sandstone and conglomerate. (See Notice of the Origin of the Copper Ores of Copper Basin, Ariz., by William P. Blake.—*Trans. Amer. Inst. Min. Engrs.*, 1889.)

Copper Queen Mine, Bisbee, Ariz.

COPPER ORE. Presented by THOMAS PRICE, San Francisco, Cal.

The product for the year 1888, as we are officially informed, was 9,380,000 pounds of copper 96 per cent. fine. At the same time the Holbrook & Cave properties, adjacent to the Copper Queen, whose ores were smelted at the works of the Copper Queen, aggregated 3,060,000 pounds, making the product of the district 12,440,000 pounds copper 96 per cent. fine.

Copper Claim, Sierra County, Cal.

PEACOCK COPPER ORE, contributed by THOMAS PRICE, San Francisco, Cal.

LEAD.

According to the Engineering and Mining Journal, the production of lead in the United States in the year 1888 amounted to 189,000 net tons, coming approximately from the sources following: Colorado, 65,000 net tons; Utah, 22,000; Idaho and Montana (being chiefly from Idaho), 39,000 tons. The production for the past fifteen years has been as follows:

Production of lead in the United States—net tons.

Year.	Arizona and California.	Colorado.	Idaho and Montana.	Missouri, Kansas, Illinois, and Wisconsin.	Nevada.	Utah.	Other States.	Total production (tons).
1873	.....	56	.....	22,381	....	15,000	5,103	42,540
1874	.....	312	.....	.....	.....	20,000	31,768	52,080
1875	.....	818	.....	24,699	.....	19,000	15,123	59,640
1876	.....	667	.....	26,421	.....	25,000	11,982	64,070
1877	.....	897	.....	31,152	19,724	27,000	3,127	81,900
1878	.....	6,369	.....	26,770	31,063	21,000	5,858	91,060
1879	.....	28,674	.....	28,130	22,805	14,000	4,171	92,780
1880	.....	35,674	.....	27,690	16,659	15,000	2,802	97,825
1881	.....	40,547	.....	30,770	12,826	24,000	8,942	117,085
1882	.....	55,000	.....	29,015	8,590	30,000	10,285	132,890
1883	3,200	70,557	11,000	21,600	6,000	29,000	2,600	143,957
1884	4,300	63,165	14,500	19,676	4,000	28,000	6,256	139,897
1885	.....	.....	.....	.....	3,500	26,000	.....	129,412
1886	.....	59,000	17,000	22,000	3,400	24,000	14,229	135,629
1887	1,000	63,000	27,000	28,000	3,400	22,000	16,300	160,700
1888	.....	65,000	39,000	33,000	.....	22,000	30,000	189,000

Mr. J. J. Valentine, of Wells, Fargo & Co., reports the total value of the lead pro-

The total production, by value, of the lead and silver of Leadville from 1860 to December 31, 1888, has been about as follows:

Years.	Production.	Years.	Production.
1860 to 1879	$10,700,000	1885	$12,357,662
1879	10,333,700	1886	13,750,882
1880	15,025,135	1887	12,072,967
1881	13,147,257	1888	11,890,205
1882	17,127,402		
1883	15,538,446	Grand total	144,721,144
1884	12,837,497		

The following statement of the quantity and value of the lead imports and exports is chiefly from the article on "Lead" by C. Kirchoff, jr.*

United States imports and exports of lead.

Fiscal years ending June 30	Imports.							Total imports.	Total exports.
	Pigs and bars.		Sheets, pipe, and shot.		Old and scrap.		Not specified.		
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.			
1867	65,322,923	$2,812,698	185,825	$9,560	1,256,233	$53,992	$6,247	$2,881,677	$32,859
1868	63,254,677	2,668,915	142,137	7,329	2,405,575	101,586	6,843	2,784,573	71,329
1869	87,965,471	3,653,481	307,424	15,531	2,983,272	123,098	18,885	3,810,995	17,249
1870	85,895,724	3,590,837	141,681	6,879	3,756,785	150,379	10,630	3,698,715	28,315
1871	91,496,715	3,721,006	86,712	4,909	2,289,688	94,467	8,740	3,828,512	79,890
1872	73,086,657	2,959,623	12,518	859	4,257,778	171,324	21,616	3,121,422	48,182
1873	72,123,641	3,233,011	105	12	3,545,098	151,756	21,553	3,406,332	13,392
1874	46,305,104	2,231,817	.....	.....	305,516	13,897	37,833	2,283,547	302,044
1875	32,770,712	1,559,017	.....	.....	382,150	13,964	26,098	1,599,079	420,309
1876	14,320,396	682,132	.....	.....	265,890	9,534	28,310	719,976	102,726
1877	14,583,845	671,482	.....	.....	249,645	8,393	2,303	682,168	49,835
1878	6,717,052	294,233	.....	.....	106,342	3,756	1,076	299,065	314,904
1879	1,216,500	42,983	.....	.....	42,983	1,153	1,139	45,275	280,771
1880	6,723,706	246,015	.....	.....	213,093	5,262	425	251,702	49,799
1881	4,322,068	180,120	.....	.....	123,018	2,729	1,605	183,493	39,710
1882	6,059,304	202,603	.....	.....	220,702	5,949	3,048	211,500	178,779
1883	4,013,967	130,108	.....	.....	1,094,133	31,724	8,126	169,958	43,108
1884	3,072,738	85,305	15,040	630	160,356	4,830	2,005	92,960	135,156
1885	5,862,474	143,101	971,951	22,217	4,896	106	1,429	166,855	123,466
1886	11,005,083	291,876	21,087	1,023	17,943	696	1,698	295,241	114,098
1887	11,148,211	321,276	19,290	950	35,081	1,452	340	345,171	141,154
1888	.....	.....	.....	.....	.....	.....	.....	639,449	121,822

Since the publication of the figures for 1888 by the Engineering and Mining Journal Mr. C. Kirchoff, jr., has given a preliminary estimate of the productions which is somewhat lower; being, in short tons of 2,000 pounds, 151,465 for desilverized lead, and 29,090 of non-argentiferous lead, a total of 180,555 tons.

* Mineral Resources of the United States for 1887. The figures for 1888 are from the Engineering and Mining Journal, January 12, 1889.

*Average monthly prices of lead in New York, in cents per pound.**

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1870	6.25	6.21	6.15	6.20	6.22	6.22	6.25	6.35	6.33	6.31	6.30	6.30	6.25
1871	6.22	6.22	6.17	6.15	6.14	6.18	6.12	6.06	6.05	5.93	5.95	5.87	6.08
1872	5.95	5.93	5.93	6.00	6.43	6.50	6.50	6.45	6.40	6.51	6.55	6.51	6.30
1873	6.32	6.45	6.37	6.37	6.50	6.33	6.06	6.12	6.50	6.50	6.25	6.06	6.32
1874	5.95	6.12	6.18	6.07	5.87	5.81	5.71	5.72	5.87	6.22	6.37	6.26	6.01
1875	6.10	5.87	5.68	5.83	5.92	5.82	5.97	5.91	5.78	5.62	5.76	5.90	5.85
1876	5.93	6.17	6.45	6.26	6.30	6.37	6.27	6.32	6.12	5.90	5.75	5.67	6.13
1877	6.12	6.30	6.62	6.37	6.77	5.65	5.50	5.00	4.80	4.55	4.62	4.55	5.49
1878	4.17	3.75	3.75	3.62	3.37	3.30	3.43	3.35	3.35	3.48	3.77	3.95	3.61
1879	4.25	4.50	3.87	3.06	3.00	3.46	4.00	4.02	3.87	4.75	5.30	5.55	4.14
1880	5.80	5.93	5.62	5.57	4.82	4.62	4.50	4.65	4.85	4.76	4.80	4.50	5.04
1881	4.65	4.95	4.75	4.60	4.47	4.37	4.70	4.85	5.16	5.06	5.07	5.12	4.81
1882	5.05	5.10	5.00	4.95	4.72	4.72	5.02	5.02	5.05	5.00	4.70	4.62	4.91
1883	4.65	4.55	4.57	4.50	4.47	4.42	4.35	4.25	4.31	4.22	3.85	3.67	4.32
1884	4.12	3.90	4.12	3.84	3.63	3.61	3.62	3.61	3.65	3.67	3.46	3.62	3.74
1885	3.65	3.65	3.65	3.65	3.65	3.75	4.00	4.25	4.25	4.20	4.10	4.55	3.95
1886	4.55	4.75	4.90	4.78	4.70	4.75	4.87	4.75	4.65	4.22	4.35	4.32	4.63
1887	4.31	4.37	4.32	4.27	4.52	4.65	4.55	4.58	4.50	4.25	4.40	5.12	4.50
1888	4.90	4.95	5.15	4.75	4.25	3.90	3.97	4.45	5.00	4.50	3.67	3.75	4.43

* From the Engineering and Mining Journal, January 12, 1888.

Bunker Hill and Sullivan Mining Company.—S. G. REED, president; V. M. CLEMENT, manager, Portland, Oregon.

ARGENTIFEROUS GALENA from the company's mines in the Cœur d'Alene Mountains, Wardner, Idaho.

CONCENTRATES from the Bunker Hill and Sullivan ores. A series of samples: Coarse and fine and tailings.

1. Product from 15^{mm} jigs: Lead, 75 per cent.; silver, 33 ounces.
2. Product from 12^{mm} jigs: Lead, 76 per cent.; silver, 33 ounces.
3. Product from 10^{mm} jigs: Lead, 74 per cent.; silver, 33 ounces.

ZINC.

In 1887–1888 there were nineteen zinc-producing establishments in active operation in the United States, and the production of the metal, grouped by States, was as follows:

Production of spelter in the United States, 1882 to 1887, inclusive, by States.

States.	1882.	1883.	1884.	1885.	1886.	1887.
	Short tons.	*Short tons.*	*Short tons.*	*Short tons.*	*Short tons.*	*Short tons.*
Illinois	18,201	16,792	17,594	19,427	21,077	22,379
Kansas	7,396	9,010	7,859	8,502	8,632	11,955
Missouri	2,500	5,730	5,230	4,677	5,870	8,660
Eastern and Southern States	5,608	5,340	7,861	8,082	6,762	7,446
Total	33,765	36,872	38,544	40,688	42,641	50,340

The preliminary reports of the production for 1888 place the amount at 57,000 short tons, of which 10,400 tons were produced in the Eastern and Southern States, about 22,500 in Illinois, and the balance in Kansas and Missouri.

The imports of the metal in blocks or pigs in 1887 were 7,432,490 pounds, valued at $240,535, and in sheets 757,245 pounds, valued at $26,658. The average price for the year, in cents, per pound was 4.91. The importation of zinc oxide for 1887 was, for dry, 2,763,642 pounds, and in oil 82,486 pounds.

New Jersey Zinc and Iron Company, B. G. CLARKE, president, 52 Wall street, New York.

ZINC AND IRON ORES from the mines of the company, Sussex County, N. J.

QUICKSILVER.

The total production of quicksilver in the United States for the calendar year 1887 was 33,825 flasks, of 76½ avoirdupois pounds, net; valued at $1,429,000. With the exception of 65 flasks from Oregon all of this was the product of California mines, distributed as follows:

New Almaden, 20,000 flasks; New Idria, 1,800; Redington, 673; Sulphur Bank, 1,490; Great Western, 1,446; Napa Consolidated, 5,574; Great Eastern, 689; various mines, including the 65 flasks from Oregon, 2,063 flasks. For the year 1888 the production was 33,250 flasks, value at the average price for the year ($42.50) $1,415,000.

The production of quicksilver in California is practically the total production for the whole United States. The amount produced by the principal mines for a series of years past, together with the value of the product, are shown by the annexed tabular statement prepared and presented by J. B. Randol:

Production of quicksilver in California.

Mines.	1879.	1880.	1881.	1882.	1883.
	Flasks.	*Flasks.*	*Flasks.*	*Flasks.*	*Flasks.*
New Almaden	20,514	23,465	26,060	28,070	29,000
Ætna and Napa Consolidated	3,605	4,416	5,552	6,842	5,890
Great Western	6,333	6,442	6,241	5,179	3,869
Sulphur Bank	9,249	10,706	11,152	5,014	2,612
New Idria	4,425	3,209	2,775	1,953	1,606
Great Eastern	1,455	1,279	1,065	2,124	1,669
Redington	4,516	2,139	2,194	2,171	1,894
Guadalupe	15,540	6,670	5,228	1,138	84
Various	8,047	1,600	584	241	101
Total	73,684	59,926	60,851	52,732	46,725
Lowest price per flask	$25.25	$27.55	$27.90	$27.35	$26.00
Highest price per flask	34.45	84.45	31.75	29.10	28.50
Average price per flask	29.85	31.00	29.80	28.25	27.25
Total value, at average price	2,100,000	1,860,000	1,810,000	1,500,000	1,275,000

Mines.	1884.	1885.	1886.	1887.	1888.
	Flasks.	*Flasks.*	*Flasks.*	*Flasks.*	*Flasks.*
New Almaden	20,000	21,400	18,000	20,000	18,000
Ætna and Napa Consolidated	2,931	1,309	3,478	2,694	959
	1,376	2,197	1,769	2,880	4,065
Great Western	3,292	3,469	1,949	1,446	625
Sulphur Bank	890	1,296	1,449	1,800	2,164
New Idria	1,025	1,144	1,406	1,490	1,320
Great Eastern	332	446	735	689	1,151
Redington	881	385	409	673	126
Guadalupe	1,179	35			
Bradford				1,543	3,848
Various	7	392	786	455	992
Total	31,913	32,073	29,981	33,760	33,250

[redacted]

8. White calcite and arragonite veinstone (crystallized) with cinnabar, bitumen, and green-colored incrustations from the 1,100-foot level, Randol shaft.
9. Bitumen in black masses associated with the white calcite and cinnabar.
10. Cinnabar, crystallized, from the 1,700-foot level, Randol shaft.
11. Quicksilver (native mercury) in bitumen, abundant in globules. From the 1,800-foot level, Randol shaft.
12. Quicksilver (native) from the bituman and veinstone at the 1,800-foot level (in a small vial).
13. Hard veinstone, or rock walls, with cinnabar and bitumen, from the 1,800-foot level, Randol shaft.
14. Granza, roasted, light color.
15. Granza, roasted. The skeleton left after driving off the quicksilver ore.
16. Granzita (slag).
17. Tierras, roasted (slag).
18. Quicksilver ore roasted.
19. Quicksilver, as produced commercially, in bottles.
20. Book of photographs, illustrating the New Almaden Mine and its surroundings.

[The collection of which the foregoing is a list is to be presented at the close of the Exposition to the École des Mines, Paris, in the name of J. B. Randol, of San Francisco.—W. P. B.]

The Quicksilver Mines and Reduction Works of New Almaden are fifteen miles south of the city of San José, Santa Clara County, Cal., in the Santa Cruz Mountains, at an elevation of 1,700 feet above the sea.

These mines were first worked for quicksilver in 1845, but the operations were on a small scale, and no record exists earlier than 1850. They have been and now are the most productive quicksilver mines in the world, excepting only the mine of Almaden in Spain. They are developed to a depth of 2,300 feet, and the workings extend horizontally over a piece of ground a mile square.

About 500 men find steady employment, the work being actively prosecuted throughout the year. From the 1st of January, 1864, to the 31st of December, 1887, the number of feet of drifting and sinking in the mines of the company, as shown by the records, amounted to 224,922 feet, or 42.60 miles, at a cost of $1,918,457.29. This does not include the excavations made in extracting ore during the period named, nor any expenses for the same, while for the ground opened up during the previous period (from 1850 to 1864) fifteen more miles of drifting and sinking can be added.

The reduction works consist of eight furnaces, and include the most improved methods for working quicksilver ores, and may be considered as the most complete and perfect in every respect in the world.

An interesting paper upon the occurrence of the ores of quicksilver in California has been published by G. Rolland.*

*Gisements de Mercure de Californie, par G. Rolland, ingénieur des mines. Annales des Mines, Septembre, Octobre, 1878.

Production of quicksilver at New Almaden, Cal., for thirty-five years and three months, from July, 1850, to December 31, 1887.

Dates.	Class and quantity of ore.			Total.
	Grueso.	Granza.	Tierras.	
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*
July, 1850, to June, 1851				4,970,717
July, 1851, to June, 1852				4,643,290
July, 1852, to June, 1853				4,839,520
July, 1853, to June, 1854				7,448,000
July, 1854, to June, 1855				9,109,300
July, 1855, to June, 1856				10,355,260
July, 1856, to June, 1857				10,299,900
July, 1857, to June, 1858				10,997,170
July, 1858, to Oct., 1858				3,873,085
Nov., 1858, to Jan., 1861	Closed by injunction.			
Feb., 1861, to Jan., 1862				13,323,200
Feb., 1862, to Jan,, 1863				15,281,400
Feb., 1863, to Aug., 1863				7,172,660
Sep., 1863, to Oct., 1863				2,346,000
Nov., 1863, to Dec., 1863	54,800	1,586,500	718,000	2,359,300
Jan., 1864, to Dec., 1864	1,259,400	18,730,300	3,287,900	23,277,600
Jan., 1865, to Dec., 1865	2,228,900	25,749,000	3,910,500	31,948,400
Jan., 1866, to Dec., 1866	1,506,000	19,939,100	5,540,200	26,885,300
Jan., 1867, to Dec., 1867	731,500	15,689,288	9,603,145	26,023,933
Jan., 1868, to Dec., 1868	2,274,208	14,566,600	12,564,722	29,405,530
Jan., 1869, to Dec., 1869	150,000	11,942,175	13,366,000	25,458,175
Jan., 1870, to Dec., 1870	30,000	12,531,900	8,535,800	21,097,700
Jan., 1871, to Dec., 1871		13,661,700	8,373,000	22,034,700
Jan., 1872, to Dec., 1872	142,000	12,777,000	8,497,600	21,416,600
Jan., 1873, to Dec., 1873		8,492,375	8,838,000	17,330,375
Jan., 1874, to Dec., 1874		11,294,000	12,160,000	23,454,000
Jan., 1875, to Dec., 1875		12,236,000	18,870,200	31,106,200

[redacted]

Production of quicksilver of New Almaden, Cal., for thirty-five years and three months, from July, 1850, to December 31, 1887—Continued.

Dates.	From furnaces.	From washings.	Total.	Average amount per month.	Yield of Quicksilver.	No. of months.
	Flasks.	*Flasks.*	*Flasks.*	*Flasks.*	*Per ct.*	
July, 1850, to June, 1851	23,875	.....	23,875	1,989½	30.74	12
July, 1851, to June, 1852	19,921	.....	19,921	1,660	32.82	12
July, 1852, to June, 1853	18,035	.....	18,035	1,503	28.50	12
July, 1853, to June, 1854	26,325	.....	26,325	2,193½	27.03	12
July, 1854, to June, 1855	31,860	.....	31,860	2,655	26.75	12
July, 1855, to June, 1856	28,083	.....	28,083	2,340½	20.74	12
July, 1856, to June, 1857	26,002	.....	26,002	2,167	19.31	12
July, 1857, to June, 1858	29,347	.....	29,347	2,445½	20.41	12
July, 1858, to Oct., 1858	10,588	.....	10,588	2,647	20.91	4
Nov., 1858, to Jan., 1861	.....	.....	.....	.....	.....	.....
Feb., 1861, to Jan., 1862	32,402	2,363	34,765	2,897	19.96	12
Feb., 1862, to Jan., 1863	39,262	1,129	40,391	2,366	20.22	12
Feb., 1863, to Aug., 1863	17,316	2,248	19,564	2,795	20.86	7
Sep., 1863, to Oct., 1863	4,830	700	5,530	2,760	18.00	2
Nov., 1863, to Dec., 1863	4,040	407	4,447	2,223½	18.65	2
Jan., 1864, to Dec., 1864	42,176	313	42,489	3,540¾	18.96	12
Jan., 1865, to Dec., 1865	47,078	116	47,194	3,933	11.80	12
Jan., 1866, to Dec., 1866	34,726	424	35,150	2,929	10.00	12
Jan., 1867, to Dec., 1867	23,990	471	24,461	2,038¼	7.19	12
Jan., 1868, to Dec., 1868	25,577	51	25,628	2,135¾	6.66	12
Jan., 1869, to Dec., 1869	16,808	.....	16,808	1,408	4.07	12
Jan., 1870, to Dec., 1870	14,423	.....	14,423	1,202	5.23	12
Jan., 1871, to Dec., 1871	18,563	5	18,568	1,547¼	6.44	12
Jan., 1872, to Dec., 1872	18,391	183	18,574	1,548	6.63	12
Jan., 1873, to Dec., 1873	11,042	.....	11,042	920	4.87	12
Jan., 1874, to Dec., 1874	8,867	217	9,084	757	2.96	12
Jan., 1875, to Dec., 1875	13,641	107	13,648	1,137¼	3.35	12
Jan., 1876, to Dec., 1876	20,549	.....	20,549	1,712½	4.71	12
Jan., 1877, to Dec., 1877	23,996	.....	23,996	1,999¾	4.93	12
Jan., 1878, to Dec., 1878	15,852	.....	15,852	1,321	3.28	12
Jan., 1879, to Dec., 1879	20,514	.....	20,514	1,709½	2.85	12
Jan., 1880, to Dec., 1880	23,465	.....	23,465	1,955½	2.92	12
Jan., 1881, to Dec., 1881	26,060	.....	26,060	2,171¾	3.10	12
Jan., 1882, to Dec., 1882	28,070	.....	28,070	2,339	2.97	12
Jan., 1883, to Dec., 1883	29,000	.....	29,000	2,416½	2.87	12
Jan., 1884, to Dec., 1884	20,000	.....	20,000	1,666½	1.93	12
Jan., 1885, to Dec., 1885	21,400	.....	21,400	1,783	2.07	12
Jan., 1886, to Dec., 1886	18,000	.....	18,000	1,500	1.69	12
Jan., 1887, to Dec., 1887	20,000	.....	20,000	1,666½	2.18	12
Totals and averages	854,054	8,734	862,788	2,039	5.75	423

Product of Enriqueta from 1880 to 1883, 10,571 flasks.

Total product of all the mines on the company's property, 873,359 flasks of 76½ pounds each, or 66,811,963½ pounds.

Bradford Mine, Napa County, Cal.
CINNABAR, "FLOAT ORE."
CINNABAR in siliceous gangue.
Contributed by H. M. NEWHALL & Co., San Francisco, Cal.

MANGANESE.

The total production of ore of manganese in the United States in 1887 was 34,524 tons of 2,240 pounds each, valued at $333,844. It is obtained chiefly from Virginia, Georgia, and Arkansas, and finds its chief market at Pittsburgh, Pa., for the production of manganese in the blast furnace.

New York and Georgia Manganese and Iron Company, 37 Broad street, New York.
MANGANESE ORE, variety called "KIDNEY MANGANESE," from near Cartersville, Ga. Contributed by J. C. CHEW, New York.

TIN.

The ore in the form of cassiterite or black tin occurs in the central and northern portions of the Black Hills of Dakota in granitic veins or dikes traversing pre-silurian slates, and also in quartz veins and as stream tin. These veins and deposits give promise of an important tin industry in the United States when they are developed. At present only prospecting operations are carried on, and there is no regular production of ore or of metal except in sample lots of a few hundredweight or tons each.

Bangor, Me.—HAMLIN, A. C., M. D.
CASSITERITE, TIN ORE, in a small vein from Winslow, Me.

Cleveland Tin Mining Company, Nigger Hill, near Spearfish and Deadwood, Black Hills, Dak.
SAMPLES OF TIN ORES AND TIN from the company's mines.

ANTIMONY.

There are several localities of stibnite or sulphide of antimony in the Pacific States, notably in California, Utah, Nevada, and Montana, but none are at present largely worked. In 1887 the total production in California was reported as 75 tons, valued at $50,500, an increase of 40 tons above the production in 1886. The production for 1888 is believed to have been less than in 1886.

Carmel, Me.—STIBNITE, Antimony Sulphide. From Dr. AUG. C. HAMLIN, Bangor, Me.

Lady of the Hills Claim, Black Hills, Dakota.
STIBNITE, Sulphide of antimony. Contributed by RICHARD C. LAKE, president First National Bank, Rapid City, Dak.

Murray, Idaho.—DAY, FRED W.
STIBNITE, Sulphide of antimony.

NICKEL.

Since the Paris Exposition of 1878 very little advance has been made in the nickel industry of the United States. At that exhibition remarkable specimens of pure wrought nickel were shown by Mr. Joseph Wharton, of Philadelphia, and were made from the sulphuret ores of Lancaster Gap. The total value of the product of metal, of the nickel in its salts, in matte, and in ore, produced in the country in 1887, is reported at $133,200. The low price of the metal from abroad has left little inducement to domestic producers to develop the mines, and most of the localities have remained unworked. The discovery, however, of ores in Oregon bearing some resemblance to the free smelting ores of New Caledonia has stimulated efforts to utilize them, and prospecting work is now carried on there. Specimens will be found in the collection.

Oregon Nickel Mines.—WILL Q. BROWN, superintendent, Riddle, Douglas County, Oregon.
NICKEL ORES, genthite and chrysoprase.

This locality is about three miles west of Riddle Station, on the California and Oregon Railway. The ores occur in beds covering areas of from one to twenty acres.

PYRITES.

The principal sources, commercially, of pyrites now utilized are the Davis Mines, Franklin County, Mass., and several mines in Louisa County, Va. The quantity and spot value of pyrites mined in the United States from 1882 to 1887 were approximately as follows:

Years	Quantity	Average value per ton	Total value.
1882	12,000	$6 00	$72,000
1883	25,000	5 50	137,500
1884	35,000	5 00	175,000
1885	49,000	4 50	220,500
1886	55,000	4 00	220,000
1887	52,500	4 00	210,000

Davis Company.—H. J. DAVIS, president, Davis, Franklin County, Mass.

MASSIVE IRON PYRITES, used for the manufacture of sulphuric acid.

COPPER PYRITES associated with the iron pyrites.

This deposit or bed or lode is opened to a depth of 400 feet, and is from 10 to 40 feet in width. Output is about 4,000 tons per month, or according to demand. About 49 per cent. of sulphur.

ALUMINA.

Alumina in the form of corundum of Beauxite and of clay is rapidly taking its place amongst the ores as the source of its metallic base—the metal aluminum. In the Cowles direct elective process pure, washed, crystallized corundum is preferred for the extraction of the metal. The silica in ordinary clay and the oxide of iron in Beauxite are reduced, together with the oxide of aluminum, and contaminate the aluminum alloys. The specimens contributed to the collection by the Cowles Company contain an example of partly fused and reduced corundum.

Cowles Elective Smelting and Aluminum Company.—Dr. L. WALDO, manager, Lockport, N. Y.

1. CORUNDUM, Georgia. As broken and washed for treatment, direct in the Cowles Furnace.
2. CORUNDUM. Partly fused and reduced in the furnace.
3. ALUMINUM BRONZE (17 per cent. aluminum; 83 per cent. copper). An addition of other metals to this product gives other alloys as shown.
4. SILICON BRONZE (19.15 per cent. silicon; 80.85 copper). Obtained by the reduction of silica. For manufacture of silicon bronze conducting wire.
5. COWLES FERRO-ALUMINUM (80.91 iron; 9.88 aluminum; 4.88 silicon). For the improvement of iron and steel castings.
6. SERIES OF COPPER AND ALUMINUM ALLOYS. Seven sample bars: Aluminum bronze, aluminum brass, aluminum hercules, aluminum silver, etc.

GRAPHITE

SALT.

The production of salt in the United States in the year 1887 was 7,831,962 barrels, valued at $4,093,846. The distribution of the production and the quantity obtained at the principal sources is shown by the annexed table:*

Salt product of the United States from 1883 *to* 1887 *inclusive.*

States.	1883.	1884.	1885.	1886.	1887.
	Barrels.	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*
Michigan	2,894,672	3,161,806	3,297,403	3,677,257	3,944,309
New York	1,619,486	1,788,454	2,304,787	2,431,563	2,353,500
Ohio	350,000	320,000	306,847	400,000	365,000
West Virginia	320,000	310,000	223,184	250,000	225,000
Louisiana	265,215	223,964	299,271	299,691	341,003
California	214,286	178,571	221,428	214,285	28,000
Utah	107,143	114,285	107,140	164,285	325,000
Nevada	21,429	17,857	28,593	30,000	.....
Illinois, Indiana, Virginia, Tennessee, Kentucky, and other States and Territories, estimated	400,000	400,000	250,000	240,000	250,000
Total	6,192,231	6,514,987	7,038,653	7,707,081	7,831,962

The Utah Central Railroad, in 1888, carried salt from its stations—Salt Lake, 5,749,646 pounds; Syracuse, 22,572,000; Nephi, 668,795; and Juab, 457,599; total, 29,158,040 pounds of salt. The first two were lake salt and the last two rock salt.

An important discovery of rock salt has been made in the State of New York, about seventeen miles south of Syracuse. At a depth of 1,218 feet the drill passed through 47 feet of salt. In the central and western counties of the State in sixty-three deep borings only seven failed to show the presence of rock salt or brine. Near Ithaca a layer of salt was found at a depth of 2,244 feet, and in the next 470 feet of depth layers of salt having an aggregate thickness of 248 feet were passed through. The thickest bed was 54 feet.

Salt has also been found by boring in Central Kansas.

PETROLEUM AND NATURAL GAS.

The principal localities yielding petroleum in commercial quantities are in western New York, western Pennsylvania, and in Ohio and West Virginia. California has also become a considerable producer of oil, and small quantities are obtained in Wyoming, in Tennessee, and Kentucky. The extent and distribution of the production is best shown by the annexed table from a report by Jos. D. Weeks.

* From the article on Salt, by William A. Rabourg, Mineral Resources of the United States for 1887, p. 611.

Production of crude petroleum in the United States and Canada from 1859 *to* 1887 *inclusive.*

Years.	Pennsylvania and New York.	West Virginia.	Ohio.	Kentucky, Tennessee, and other States.	California.	Total United States.	Canada. (a)
	Barrels. (b)	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*
1859	2,000	.....	.....	.....	.....	2,000	.....
1860	500,000	.....	.....	.....	.....	500,000	.....
1861	2,113,609	.....	.....	.....	.....	2,113,609	.....
1862 (c)	3,056,690	.....	.....	.....	.....	3,056,690	11,775
1863	2,611,309	.....	.....	.....	.....	2,611,309	82,814
1864	2,116,109	.....	.....	.....	.....	2,116,109	90,000
1865	2,497,700	.....	.....	.....	.....	2,497,700	110,000
1866	3,597,700	.....	.....	.....	.....	3,597,700	175,000
1867	3,347,300	.....	.....	.....	.....	3,347,300	190,000
1868	3,646,117	.....	.....	.....	.....	3,646,117	200,000
1869	4,215,000	.....	.....	.....	.....	4,215,000	220,000
1870	5,260,745	.....	.....	.....	.....	5,260,745	250,000
1871	5,205,234	.....	.....	.....	.....	5,205,234	269,397
1872	6,293,194	.....	.....	.....	.....	6,293,194	308,100
1873	9,893,786	.....	.....	.....	.....	9,893,786	365,052
1874	10,926,945	.....	.....	.....	.....	10,926,945	168,897
1875	8,787,514	(d)3,000,000	(d) 200,000	.....	(d) 175,000	12,162,514	220,000
1876	8,968,906	120,000	31,763	.....	12,000	9,132,669	312,000
1877	13,135,475	172,000	29,888	.....	13,000	13,350,363	312,000
1878	15,163,462	180,000	38,179	.....	15,227	15,396,868	312,000
1879	19,685,176	180,000	29,112	.....	19,858	19,914,146	575,000
1880	26,027,631	179,000	38,940	.....	40,552	26,286,123	350,000
1881	27,376,509	151,000	33,807	.....	99,862	27,661,238	275,000
1882	30,053,500	128,000	39,761	.....	128,636	30,349,897	275,000
1883	23,128,389	126,000	47,632	.....	142,857	23,444,878	250,000
1884	23,772,209	90,000	90,081	.....	262,000	24,214,290	250,000
1885	20,776,041	91,000	650,000	.....	325,000	21,842,041	250,000

Months.	Wells completed.		New production.		Average production per well.		Wells drilling.		Rigs up and building.		Dry holes.	
	1888.	1887.	1888.	1887.	1888.	1887.	1888.	1887.	1888.	1887.	1888.	1887.
			Bbls.	*Bbls.*	*Bbls.*	*Bbls.*						
January	57	151	879	3,358	15.42	22.25	64	200	29	75	19	33
February	52	162	649	7,344	12.50	45.33	72	177	36	69	17	32
March	56	133	3,701	4,112	66	31	65	158	3	75	19	32
April	49	154	461	5,519	9.41	36	59	130	26	71	20	6
May	56	151	3,367	2,789	60	18.50	81	172	35	69	17	30
June	87	157	3,934	4,688	45.21	30	106	142	68	60	23	35
July	82	159	1,129	2,078	13.77	13	124	135	46	78	25	45
August	96	142	1,824	5,327	19	37.50	106	137	61	62	38	34
September	132	137	2,512	5,949	18	43.50	226	106	106	67	18	30
October	229	100	3,142	3,98	13.72	36	333	104	187	82	54	25
November	307	90	3,919	1,792	12.75	20	327	114	218	40	60	6
December	301	96	3,974	1,091	13.20	11.33	337	88	193	46	64	29
Total	1,504	1,632	29,491	47,645	*24.91	*28.70	1,900	1,663	1,093	803	372	397

*Average per year.

The value of this mineral oil, based on the value of petroleum in Pennsylvania since the year 1860, ranged from $19.25 in January, 1860, to 10 cents per barrel at the end of the year 1861. It is believed that $1 per barrel would not exceed the average price of the oil for the period, which would make the total value of petroleum produced in the United States from the first general utilization of it until the end of 1887, $345,573,177.

California oil is estimated at $2 per barrel, while the crude Lima oil of Ohio sold as low as 15 cents per barrel (42 gallons) in 1887. The average value of pipe-line certificates in Pennsylvania during the year 1887 was 66¾ cents per barrel. The average for 1888 was 87¼ cents.

The Chief of the Bureau of Statistics reports the total values of the exports of mineral oils from the United States during the month of December, 1888, and during the twelve months ended December 31, 1888, as compared with similar exports during the corresponding periods of the preceding year, as follows: December, 1888, $3,119,508; December, 1887, $3,985,702; twelve months ended December 31, 1888, $15,969,000; twelve months ended December 31, 1887, $15,231,988. The exports from the above-named ports comprise about 99 per cent. of the total exports of mineral oils. It is stated on good authority that the distillation of 100 gallons of crude petroleum will yield 76 gallons of illuminating oil, 12 gallons of gasoline, benzine, or naphtha, 3 gallons of lubricating oil, and 9 gallons of residuum. In the first week of January, 1889, the price ranged from 86 to 87½.

The vast supplies of natural combustible gas, which have become such an important factor in the industries of western Pennsylvania and the adjacent regions, are obtained chiefly from the Trenton limestones of Ohio and the Upper Coal Measures of Pennsylvania. It is not possible to state the exact amount of consumption of this fuel in cubic feet. The best basis of calculation is the amount of coal which is displaced by the gas. From the tables given by Joseph D. Weeks (Min. Res. U. S., p. 466), it appears that the total consumption in 1887 was equivalent to coal displacement 9,867,000 tons, valued at $15,838,500. This important mineral product is represented in the collection by two small photographs of the burning gas from two wells in Ohio.

Karg Gas Well, Findlay, Ohio. Compliments of C. C. CONROY and S. COMFORT, New York.

PHOTOGRAPH OF BURNING GAS illustrating the force and volume. Depth of the well 1,144 feet. Flows over 40,000,000 cubic feet per day.

Conroy & Johnson Gas Well, Van Buren, Ohio. Compliments of C. C. CONROY and S. COMFORT.

PHOTOGRAPH, taken at night, of the burning gas, illustrating the force of discharge and the volume of the gas.

FERTILIZERS.

The amount of phosphate rock shipped from and consumed in South Carolina in the year 1887 was 480,558 long tons; 90 per cent. of the shipments from Charleston is land rock, and from Beaufort and vicinage is all river and marsh rock.

There were also 8,226 long tons of guano, valued at $55,671, brought from island rocks and keys appertaining to the United States. The importations for 1887 reached a total value of $1,337,350. In the year 1888 the production of river rock was 190,274 gross tons and of land rock 259,330 long tons, of which 3,650 tons were sent abroad and 60,000 tons were used in South Carolina, and the remainder was manufactured elsewhere. This makes a total of nearly 450,000 tons mined in 1888.

Mexican Phosphate and Sulphur Company.—H. DUTARD, president, A. HALSEY, secretary, H. M. NEWHALL & Co., agents, San Francisco, Cal.

SUPERPHOSPHATE FERTILIZER COMPOUND, made in San Francisco, from genuine guano phosphate, mined in the Gulf of California, 85 to 93 per cent. of phosphate of lime. Price $30 per ton.

Over $600,000 worth of this product has been sold, and is mostly shipped to Europe.

GYPSUM, LIME, AND MICA.

Gypsum is an abundant mineral in the United States, but at present is obtained

Lime is produced in nearly all the States and Territories. The production during the year 1887 is estimated at 46,750,000 barrels of 200 pounds each, valued at $23,375,000, an average value at the kiln of 50 cents.

Limestone, magnesian. From the quarry of J. S. Adam & Co., lime manufacturers, Canaan, Conn. Contributed by J. S. ADAM, Canaan.

The industry of lime burning was established in Canaan as ea ly as 1820. Lime was shipped to Hartford, to the towns along the Hudson River, and some as far as Newark, N. J. There are now four companies engaged in the business. Three of these use wood as fuel, and J. S. Adam & Co. use crude petroleum from Lima, Ohio. In the wood-burning kilns 432 to 576 cubic feet of wood are consumed each twenty-four hours, with a production of 18,000 pounds of lime. In the oil-burning kiln 450 gallons of oil are consumed in twenty-four hours, with a production of 21,000 pounds of lime. There are altogether ten kilns in Canaan, with a total daily capacity of 180,000 pounds of lime. The market for this product is found in Connecticut, Massachusetts, Rhode Island, and New York.

Mica is used extensively in the United States for small lights, openings, or windows for stoves, permitting the fire to be seen. It is mined chiefly in North Carolina, New Hampshire, and Virginia. The production in 1887 was 70,500 pounds, valued at $142,250. The importations for the same period were valued at $63,480.

Maricopa Mica, Maricopa Mountains, Arizona. Contributed from the collection of WILLIAM P. BLAKE.

This variety has little commercial value, being marked internally by inclusions or bands of other minerals or oxides.

Muscovite Mica, Black Hills of Dakota. Lent from the collection of WILLIAM P. BLAKE.

BUILDING STONE, MARBLE, SLATES, ETC.

The value of building stone quarried in the United States is estimated at $25,000,000 for the year 1887. The use of granite, both rough and polished, is extending rapidly for building purposes and for monuments. The value of this material at the quarries in 1887 is estimated at $7,440,000. The marble industry is increasing in importance yearly. The production in 1887 was valued at $3,100,000. Sandstone is also an important material: its value in 1887 is estimated at $6,500,000.

There are several exhibits of the brown and red sandstone of the Connecticut River quarries, and a special exhibition of the red granite of Maine and of the quartzite and granite of Minnesota.

Slate of various colors is produced abundantly in the Unit d States in Maine, Vermont, and Pennsylvania. The purple, green, and red slates come chiefly from Vermont. This material is used not only for roofing, but largely in construction, especially for mantels, for tiling, and for tables. It is also now employed for burial cases and linings of graves.

The extent of the production and the chief localities are shown as follows:

Production of roofing slate in all sections during the years 1884, 1885, 1886, *and* 1887.

[Squares of 100 square feet each.]

Sections.	1884.	1885.	1886.	1887.
Bangor and Pen Argyl region, Pennsylvania	195,505	196,832	215,341	230,000
Slatington section, Pennsylvania	104,000	108,000	109,000	112,000
Vermont	85,000	130,000	111,385	120,000
Maine	41,000	34,000	36,000	37,000
Chapman's	29,499	26,328	24,464	28,439
Peach Bottom	10,000	14,500	12,000	20,000
Virginia	9,000	17,300	16,600	19,000
Michigan	7,000	10,000	12,000	7,200
Total	481,004	5 6,960	536,790	573,639

The average value of slate at the quarries, loaded on cars, in 1887 was $3 per square. The exports of slate reached a value of $62,052 in 1887.

Blanchard Slate Quarry Company.—A. C. HAMLIN, president, Blanchard and Bangor, Me.

SAMPLES OF SLATE from the Blanchard quarry.

This quarry is now being worked and is producing slate of superior quality, being remarkable for perfection of rift, tenacity, and elasticity. The stratum extends from one to two miles. (See also a special display by the company.)

Drake Company, Sioux Falls, Dak. JAMES H. DRAKE, president.

COMPACT QUARTZITE OR JASPER, Sioux Falls. Granite from the Drake quarries; Minnesota silicified wood, Arizona.

The compact quartzite is extensively quarried and used for building and for paving. The shipments last year (1888) from Minnehaha County and the Territory of Dakota (in which the deposit lies) were over 4,000 car-loads. Number of men employed, 800.

Estimated production of precious stones in the United States from 1883 to 1887.

Species.	1883.			1884.			1885.			1886.			1887.		
	Value of stones found and sold as specimens and curiosities, occasionally polished to beautify or show structure.	Value of stones found and sold to be cut into gems.	Total.	Value of stones found and sold as specimens and curiosities, occasionally polished to beautify or show structure.	Value of stones found and sold to be cut into gems.	Total.	Value of stones found and sold as specimens and curiosities, occasionally polished to beautify or show structure.	Value of stones found and sold to be cut into gems.	Total.	Value of stones found and sold as specimens and curiosities, occasionally polished to beautify or show structure.	Value of stones found and sold to be cut into gems.	Total.	Value of stones found and sold as specimens and curiosities, occasionally polished to beautify or show structure.	Value of stones found and sold to be cut into gems.	Total.
Diamond					$800	$800					$60	$60			
Sapphire gems	$300	$2,000	$2,300	$250	1,500	1,750		$500	$500	$250	500	750		$500	$500
Chrysoberyl	100		100	25		25									
Topaz	1,000		1,000	200	300	500	$1,000	250	1,250	1,000		1,000	$1,500	500	2,000
Beryl	300	300	600	300	400	700	250	500	750		5,500	5,500	500	3,000	3,500
Emerald	500		500						3,500	3,000	200	3,200			
Hiddenite	100	500	600						2,500	3,700	1,000	4,700			
Tourmaline				1,500	500	2,000	500	100	600	3,500	2,000	5,500	300	200	500
Smoky quartz	2,700	7,500	10,000	2,000	10,000	12,000	2,000	5,000	7,000	2,000	5,000	7,000	1,500	3,000	4,500
Quartz crystal	10,000	1,500	11,500	10,000	1,500	11,500	10,000	1,500	11,500	10,000	1,500	11,500	10,000	1,500	11,500
Silicified wood	5,000		5,000	10,000	500	10,500	5,000	1,500	6,500	500	1,000	1,500	85,000	1,000	86,000
Garnet	1,000	5,000	6,000	1,000	3,000	4,000	300	2,500	2,700	1,250	2,000	3,250	2,500	1,000	3,500
Andalusite		2,500	2,500		2,500	2,500		2,500	2,500		2,500	2,500	2,000		2,000
Pyrite	1,500	500	2,000	2,000	1,000	3,000	1,500	500	2,000	1,500	500	2,000	2,000	500	2,500
Amazonstone	3,500	250	3,750	2,750	250	2,750	2,500	250	2,750	2,000	250	2,250	1,500	200	1,700
Cellular opalstone	10,000		10,000	10,000		10,000	10,000		10,000	10,000		10,000	5,000		5,000
Arrow points	1,000		1,000	1,000		1,000		2,500	2,500		2,500	2,500		1,500	1,500
Trilobites	700		700	500		500		1,000	1,000	1,000		1,000	500		500
Sagenitic rutile	700	500	1,000	500	500	1,000		250	250	1,750		1,750			
Hornblende in quartz	500	100	600	500	100	600		300	300	200		200	100		100
Tremolite	250	500	750	250	500	750	250	500	750	100	300	100	250	500	750
Diopside	200	100	300				100		100				50		50
Azoite	1,000	500	1,500	1,000	500	4,500	1,000	1,000	2,000	1,000	1,000	2,000	3,000	1,000	4,000
Chloastrolite	500	1,000	1,500	500	1,000	1,500				500	500	1,000	200	600	800
Turquois	1,500	500	2,000	1,500	500	2,000	1,500	500	3,500	1,000	2,000	3,000	1,000	1,500	2,500
Moss agate	1,000	2,000	3,000	1,000	2,000	3,000	500	2,000	2,500	1,000	1,000	2,000	200	750	950
Amethyst	2,000	250	2,250	2,000	250	2,250	2,000	100	2,100	2000	100	2,100	1,000	100	2,100
Jasper	2,000	500	2,500	2,000	500	2,500									
Sunstone	250	200	450	250	200	450	250	100	350	200	100	300	50	100	150
Fossil coral	500	250	750	500	250	750				1,000		1,000	1,500	500	2,000
Rutile							700		700	750		750			
Total	47,300	26,450	73,750	74,275	28,550	82,825	30,300	24,870	69,870	49,000	29,510	78,510	50,650	17,900	68,600
Gold quartz	40,000	75,000	115,000	40,000	100,000	140,000	40,000	100,000	140,000			40,000			75,000

Tourmalines of Mount Mica, Maine. MOUNT MICA TIN AND MICA COMPANY and A. C. HAMLIN, M. D., Bangor, Me.

TEN CUT GEMS, illustrating the gradations and varieties of color of the transparent tourmalines found at Mount Mica, Maine.

1. Square cut, nearly colorless; faint shade of green, transparent.
2. Square cut rubellite, rose-pink, transparent.
3. Green, blue-green, 6¼ carats weight.
4. Chrysoberyl green, 6½ carats; perfect stone and a very rare gem for color and brilliance.
5. Emerald green, oblong cut; 11¼ carats. One of the finest gems found in the United States.
6. Deep blue Indicolite, 11¾ carats. The largest blue stone found at Mount Mica; perfect gem.
7. Light green, blue tint; 7$\frac{1}{16}$ carats; rare.
8. Pale rose tint, nearly colorless.
9. Deep garnet red.
10. Pale grass green.

Drake Company, J. H. DRAKE, president, Sioux Falls, Dak.

SILICIFIED AGATIZED WOOD, from Chalcedony Park, Apache County, Ariz.

A single specimen is here shown, and reference is made to the special display made by the company for objects of great size and variety. The silicified wood from this locality was first brought to notice by the United States Pacific Railroad survey of the thirty-fifth parallel of latitude under Lieutenant Whipple (*vide* Vol. III, Pacific R. R. Explor. and Surveys).

The material occurs in large quantity, and appears to be the remains of an entombed forest of Auracasians silicified, it is supposed, by infiltrated or hot geyser water after the process by which such material is produced in the National Park in Montana, and in Wyoming, California, and elsewhere; but, unlike any other specimens heretofore found, this material is in many cases perfect in its preservation, showing the bark of the trees, with the heart lines perfect, and under a microscope revealing the cell structures of the wood unimpaired. It is a scientific won-

MISCELLANEOUS MINERALS.

Amblygonite. Paris, Me., from Dr. A. C. HAMLIN, Bangor, Me.

Blake, William P., Mining Engineer, Mill Rock, New Haven, Conn.
MINERALS sent from his mineralogical cabinet.
CALAMINE, Sussex County, N. J.
COLUMBITE, Etta Mine, Black Hills, Dakota.
MICA (Muscovite), Maricopa, Ariz.
MICA (Muscovite), Black Hills, Dakota.
PECTOLITE, massive, polished, Tehama County, Cal.
SPODUMENE, large crystalline mass, Etta Mine, Black Hills, Dakota.
VANADINITE (crystallized), Prescott, Ariz.
STROMEYERITE (large mass), Silver King Mine, Pinal County, Ariz.

Calamine. Sussex County, N. J. Lent by W. P. BLAKE.

Columbite. Large crystalline mass. From the Etta Mine, Black Hills, Dakota. Lent by W. P. BLAKE.

Fluor Spar. Group of crystals fourteen inches square. Macomb, St. Lawrence County, N. Y. From GEORGE F. KUNZ, New York City.

Gadolinite. Large mass. Bluffton, near Llano County, Tex. Lent by GEORGE F. KUNZ, New York City.

Hamlin, Dr. A. C., Bangor, Me.
MINERAL FROM MAINE LOCALITIES: Amblygonite cassiterite; antimony sulphide; lepidolite; clevelandite; tourmalines, etc.

Kunz, George F., New York City.
MINERALS LENT FROM HIS CABINET.
GREEN FLUOR SPAR, Macomb, N. Y.
GADOLINITE. Eleven pound crystal; near Bluffton, Burnett County, Tex.

Lepidolite, Clevelandite, Green Tourmalines, etc. Mount Mica, Maine. From Dr. A. C. HAMLIN, Bangor, Me.

Mammoth Mine. Pima County, Ariz.
WULFENITE, DESCLOIZITE, AND DECHENITE. From Prof. THOMAS PRICE, San Francisco, Cal.

Newhall, H. M., & Co., San Francisco, Cal.
CRUDE AND MANUFACTURED BORAX, from Teel's Marsh, Esmeralda County, Nev.
MEXITE, borate of lime, Teel's Marsh.
TINCAL, Teel's Marsh.
BORAX, manufactured from the borates of Teel's Marsh.

Pectolite. Massive, cut and polished. From Tehama County, Cal. Lent by W. P. BLAKE.

Price, Prof. Thomas, San Francisco, Cal.
MINERALS: From the Quijoatoas Mines, and Mammoth Mine, Pima County, Ariz.

Quijoatoas Mines, Arizona.
ARRAGONITE.
DOGTOOTH SPAR in crystals on plumose manganese oxyd. Contributed by Prof. THOMAS PRICE, San Francisco, Cal.

Red Tourmalines in Lepidolite. Andover, Me. From Dr. A. C. HAMLIN, Bangor, Me.

For cut tourmaline, as gems, see under the head of "Precious Stones and Gems."

Slate—Roofing Slate, rifted out, from Blanchard, Me. From Dr. AUG. C. HAMLIN.

This slate quarry is now being worked. Length of beds from one to two miles; width undetermined. Remarkable for perfection of rift, tenacity, and elasticity. (*See* Special Exhibition.)

Spodumene. Crystalline mass.

Etta Mine, Black Hills, Dak. Lent by WILLIAM P. BLAKE.

Uintahite. Gilson's Mine, Uintah Mountains, Uintah County, Utah. Contributed by JOSEPH R. WALKER, Salt Lake City.

An asphalt resembling Albertite. For description see Transactions Amer. Inst. Mining Engineers, Vol. XVI, p. 162; also, Eng. and Min. Jour., Dec., 1885.

Vanadinite—Vanadate of Lead. Yuma County, Ariz. Contributed by Prof. THOMAS PRICE, San Francisco, Cal.

Vanadinite—Vanadate of Lead. From near Prescott, Ariz. Lent by WILLIAM P. BLAKE.

STATISTICAL TABLES.

The approximate distribution, in round numbers, by States and Territories, of the product of the precious metals in the United States substantially as estimated for 1887 is exhibited in the following table showing the weight of the metal in fine ounces, and the coining value of the same:*

I.—*Distribution of the product of gold and silver in the United States during the calendar year* 1887 *by States and Territories.*

State or Territory.	Gold.		Silver.		Total value.
	Fine ounces.	Value.	Fine ounces.	Value.	

II.—*Production of gold and silver in the United States from the organization of the Mint, in* 1792, *to* 1844, *and annually since.*

[The estimate from 1792 to 1873, inclusive, is by R. W. Raymond, Commissioner, and since by the Director of the Mint.]

Years.	Gold.	Silver.	Total.
Apr. 2, 1792—July 31, 1834	$14,000,000	Insignificant.	$14,000,000
July 31, 1834—December 31, 1844	7,500,000	$250,000	7,750,000
1845	1,008,327	50,000	1,058,327
1846	1,139,357	50,000	1,189,357
1847	889,085	50,000	939,085
1848	10,000,000	50,000	10,050,000
1849	40,000,000	50,000	40,050,000
1850	50,000,000	50,000	50,050,000
1851	55,000,000	50,000	55,050,000
1852	60,000,000	50,000	60,050,000
1853	65,000,000	50,000	65,050,000
1854	60,000,000	50,000	60,050,000
1855	55,000,000	50,000	55,050,000
1856	55,000,000	50,000	55,050,000
1857	55,000,000	50,000	55,050,000
1858	50,000,000	500,000	50,500,000
1859	50,000,000	100,000	50,100,000
1860	46,000,000	150,000	46,150,000
1861	43,000,000	2,000,000	45,000,000
1862	39,200,000	4,500,000	43,700,000
1863	40,000,000	8,500,000	48,500,000
1864	46,100,000	11,000,000	57,100,000
1865	53,225,000	11,250,000	64,475,000
1866	53,500,000	10,000,000	63,500,000
1867	51,725,000	13,500,000	65,225,000
1868	48,000,000	12,000,000	60,000,000
1869	49,500,000	12,000,000	61,000,000
1870	50,000,000	16,000,000	66,000,000
1871	43,500,000	23,000,000	66,500,000
1872	36,000,000	28,750,000	64,750,000
1873	36,000,000	35,750,000	71,750,000
1874	33,500,000	37,300,000	70,800,000
1875	33,400,000	31,700,000	65,100,000
1876	39,900,000	38,800,000	78,700,000
1877	46,900,000	39,800,000	86,700,000
1878	51,200,000	45,200,000	96,400,000
1879	38,900,000	40,800,000	79,700,000
1880	36,000,000	39,200,000	75,200,000
1881	34,700,000	43,000,000	77,700,000
1882	32,500,000	46,800,000	79,300,000
1883	30,000,000	46,200,000	76,200,000
1884	30,800,000	48,800,000	79,600,000
1885	31,800,000	51,600,000	83,400,000
1886	35,000,000	51,000,000	86,000,000
1887	33,000,000	53,350,000	86,350,000
Total	1,772,896,769	803,450,000	2,576,396,769

Through the courtesy of the Mint Bureau, we are enabled to supply the precise official figures of the coinage of the mints of the United States for the calendar year of 1888 as follows:

III.—*Gold and silver coinage at the mints of the United States.*

[From the Financial and Mining Record, January 19, 1889.]

Denomination.	Pieces.	Value.
Double eagles	1,085,866	$21,717,320.00
Eagles	803,031	8,030,310.00
Half eagles	312,196	1,560,980.00
Three dollars	5,291	15,873.00
Quarter-eagles	16,098	40,245.00
Dollars	16,080	16,080.00
Total gold	2,238,562	31,380,848.00
Standard dollars	31,990,833	31,990,833.00
Half dollars	12,833	6,416.50
Quarter dollars	1,226,833	306,708.25
Dimes	7,216,487	721,648.70
Total silver	40,446,986	33,025,606.45
Five cents	10,720,483	536,024.15
Three cents	41,083	1,232.49
One cent	37,494,414	374,944.14
Total minor	48,255,980	912,200.78
Total coinage	90,941,528	65,318,615.23

IV.—*Dividends paid by some American mines in the year* 1888, *and the total to date for the mines named.*

[From the Engineering and Mining Journal, January, 1889.]

Name of company.	Location of mine.	Amount of dividends paid in 1888.	Total amount of dividends paid to date.	Present market value of the company.
Alice	Montana	$25,000	$775,000	$400,000
Alpha	Nevada	45,000	45,000	(*)

[redacted]

IV.—*Dividends paid by some American mines in the year* 1888—Continued.

Name of company.	Location of mine.	Amount of dividends paid in 1888.	Total amount of dividends paid to date.	Present market value of the company.
Golconda	Idaho	$120,000	$120,000	(*)
Granite	....do	10,000	10,000	(*)
Granite Mountain	Montana	1,600,000	5,200,000	$14,000,000
Hale and Norcross	Nevada	224,000	1,822,500	616,000
Hecla Consolidated	Montana	100,000	1,257,500	(*)
Homestake	Dakota	300,000	4,293,750	2,750,000
Hope	Montana	50,000	233,252	450,000
Hubert	Colorado	18,000	239,500	(*)
Idaho	California	356,500	5,057,650	(*)
Iron Silver	Colorado	300,000	2,400,000	1,600,000
Jay Gould	Montana	226,000	321,000	(*)
Little Chief	Colorado	20,000	800,000	40,000
Mammoth	Utah	50,000	70,000	(*)
Mary Murphy	Colorado	87,500	175,000	.....
Mascotte	....do	2,500	2,500	.....
Montana, Limited	Montana	412,500	2,068,467	6,600,000
Morning Star	Colorado	50,000	800,000	(*)
Mount Diablo	Nevada	40,000	120,000	125,000
New Guston Co., Limited	Colorado	100,000	100,000	(*)
North Belle Isle	Nevada	200,000	230,000	280,000
North Star	California	150,000	150,000	(*)
Ontario	Utah	900,000	9,735,000	4,875,000
Original	Montana	6,000	123,000	(*)
Osceola	Michigan	150,000	1,172,500	950,000
Pamlico	Nevada	21,000	21,000	(*)
Parrott	Montana	144,000	300,000	(*)
Pittsburg	Nevada	29,850	29,850	300,000
Plumas-Eureka	California	70,310	2,425,000	35,181
Plymouth Consolidated	....do	80,000	2,320,000	900,000
Poorman	Colorado	25,000	25,000	(*)
Quicksilver Preferred	California	282,663	1,337,575	1,505,000
Quincy	Michigan	360,000	4,070,000	3,400,000
Sherwood	Missouri	3,000	6,000	(*)
Sierra Buttes	California	15,312	1,568,145	306,250
Sierra Nevada	Idaho	20,000	20,000	(*)
Silver Mg. of Lake Valley	New Mexico	25,000	25,000	100,000
Standard	California	50,000	3,595,000	100,000
Swansea	Colorado	3,000	6,000	(*)
Tamarack	Michigan	640,000	600,000	6,280,000
Viola, Limited	Idaho	93,750	337,500	300,000
Total, 64 companies		13,061,105	101,483,709	90,045,531
In 1887, 63 companies		10,515,753	98,519,767	89,096,135
In 1886, 59 companies		10,282,063	81,751,981	85,707,771

* Stocks not quoted on any exchange.

The above table includes dividends paid in cash only from mines located in the United States, and the figures given are almost all from official sources. There are also a large number of dividend paying properties worked and owned by private individuals or "close corporations," of which it is impossible to secure an accurate record.

V.—*Dividends declared in* 1884, 1885, 1886, 1887, *and* 1888.

	1884.	1885.	1886.	1887.	1888.
Arizona	$372,500	$200,000	$225,000	$175,000	$140,000
California	1,714,474	1,132,169	1,035,684	877,085	1,004,785
Colorado	1,349,000	1,542,000	2,044,250	1,427,500	881,000
Dakota	578,250	775,000	773,500	400,700	316,000
Idaho	.....	87,500	195,000	75,000	476,250
Michigan	1,802,500	1,970,000	1,900,000	1,575,000	3,500,000
Missouri	40,000	66,000	184,000	93,000	3,000
Montana	847,000	1,377,050	2,439,622	3,127,918	3,049,500
Nevada	198,500	175,000	436,287	1,328,000	2,035,070
New Hampshire	15,000	18,750	3,750	.....	.....
New Mexico	199,000	.....	70,000	79,000	200,000
North Carolina	.....	37,200	.....	.....	.....
Utah	2,137,500	1,055,000	975,000	1,357,500	1,456,500
Vermont	31,000	30,000	.....	.....	.....
Total	9,284,724	8,465,669	10,282,093	10,515,703	13,061,105

VI.—*Assessments levied, or calls upon the shareholders by mining companies in* 1888.

Name and location of company.	Total levied in 1888.	Total levied to date.	Name and location of company.	Total levied in 1888.	Total levied to date.
Allouez, Mich	$80,000	$657,000	Keyes, Nev	$95,000	$95,000
Alpha M. and M., Nev	52,500	52,500	King of West, Idaho	15,000	45,000
Alpha, Nev	52,500	562,500	Kossuth, Nev	10,800	433,000
Alta, Nev	108,000	2,248,800	Lady Washington, Nev.	27,000	107,000
Andes, Nev	50,000	950,000	Locomotive, Ariz	25,000	100,000
Anchor, Utah	105,000	175,000	Mayflower, Cal	175,000	435,000
Baltimore, Nev	75,000	75,000	Mexican, Nev	50,400	3,380,600
Belcher, Nev	156,000	2,770,000	Mikado, Mich	6,000	15,200
Bellevue-Idaho, Idaho	18,750	76,250	Mono, Cal	25,000	685,000
Benton Cons., Nev	108,000	556,000	Navajo, Nev	30,000	455,000
Best & Belcher, Nev	100,800	2,054,590	Navajo Queen, Nev	20,000	20,000
Bodie Cons., Cal	100,000	500,000	North Belle Isle, Nev	50,000	275,000
Bodie Tunnel, Cal	25,000	245,000	North Bonanza, Nev	15,000	230,000

VII.—*Statistics of the production of gold, silver, lead, and copper in the States and Territories west of the Missouri River during the year* 1888 *(to January* 1, 1889).

[Copy of the annual statement issued by John J. Valentine, vice-president and general manager, Wells, Fargo & Co.]

San Francisco, December 31, 1888.

WILLIAM P. BLAKE,

Special Agent, U. S. Mineral Collection, New York:

DEAR SIR: The following is a copy of our annual statement of precious metals produced in the States and Territories west of the Missouri River (including British Columbia, and receipts by express from the West Coast States of Mexico) during 1888, which shows aggregate products as follows: Gold, $30,468,052; silver, $54,348,420; copper, $18,261,490; lead, $11,263,630. Total gross result, $114,341,592.

As stated repeatedly, the facilities afforded for the transportation of bullion, ores, and base metals by the extension of railroads into mining districts increase the difficulty of verifying the reports of the products from several important localities; especially is this the case in the reports from Colorado and Montana. And the general tendency is to exaggeration when the actual values are not obtainable from authentic sources; but the aggregate result, as shown herein, we think may be relied on with reasonable confidence as approximately correct.

States and Territories.	Gold dust and bullion by express.	Gold dust and bullion by other conveyances.	Silver bullion by express.	Ores and base bullion by freight.	Total.
California	$9,160,068	$916,008	$652,652	$1,334,725	$12,063,468
Nevada	2,876,275		6,858,530	2,570,808	12,305,608
Oregon	601,506	100,000			701,506
Washington	94,112	30,000			124,112
Alaska		820,000			820,000
Idaho	2,635,000		3,700,000	2,350,000	8,685,000
Montana	5,100,000		11,500,000	15,776,000	32,376,000
Utah	277,720		3,479,138	3,800,383	7,557,241
Colorado	3,100,000		17,725,100	5,930,400	26,755,500
New Mexico	193,598	50,000	183,641	2,782,040	3,209,279
Arizona	712,600	100,000	850,798	3,460,470	5,123,868
Dakota	2,300,716	100,000	453,216		2,943,932
Mexico (West Coast States)	950		1,195,673		1,196,623
British Columbia	479,400				479,400
Total	27,622,020	2,116,008	46,598,738	38,004,826	114,341,592

The gross yield for 1888, shown above, segregated, is approximately as follows:

Gold (26.65)	$30,468,052
Silver (47.53)	54,348,420
Copper (15.97)	18,261,490
Lead (9.85)	11,263,630
Total	114,341,592

Annual products of lead, copper, silver, and gold in the States and Territories west of the Missouri River, 1870–1888.

Year.	Production as per Wells, Fargo & Co.'s statements, including amounts from British Columbia and west coast of Mexico.	Product after deducting amounts from British Columbia and west coast of Mexico.	The net products of the States and Territories west of the Missouri River, exclusive of British Columbia and west coast of Mexico, divided, is as follows:			
			Lead.	Copper.	Silver.	Gold.
1870	$54,000,000	$52,150,000	$1,080,000		$17,320,000	$33,750,000
1871	58,284,000	55,784,000	2,100,000		19,286,000	34,398,000
1872	62,236,959	60,351,824	2,250,000		19,924,429	38,177,395
1873	72,258,693	70,139,860	3,450,000		27,483,302	39,206,558
1874	74,401,045	71,965,610	3,800,000		29,699,122	38,466,488
1875	80,889,057	76,708,433	5,100,000		31,635,239	39,968,194
1876	90,875,173	87,219,859	5,040,000		39,292,924	42,886,935
1877	98,421,754	95,811,582	5,085,250		45,846,109	44,880,223
1878	81,154,622	78,276,167	3,452,000		37,248,137	37,576,030
1879	75,349,501	72,688,888	4,185,769		37,032,875	31,470,262
1880	80,167,936	77,232,512	5,742,390	$898,000	38,033,055	32,559,067
1881	84,504,417	81,198,474	6,361,902	1,195,000	42,987,613	30,653,959
1882	92,411,835	89,207,549	8,008,155	4,055,037	48,133,039	29,011,318
1883	90,313,612	84,639,212	8,163,550	5,683,921	42,975,101	27,816,640
1884	84,975,954	81,633,835	6,834,091	6,066,252	43,529,925	25,183,567
1885	90,181,260	87,311,382	8,562,991	7,838,036	44,516,599	26,393,756
1886	103,011,761	100,160,222	9,185,192	9,276,755	52,136,851	29,561,424
1887	104,645,959	103,327,770	9,631,073	10,362,746	50,833,884	32,500,067
1888	114,341,592	112,665,569	11,203,630	18,261,490	53,152,747	29,987,702

The exports of silver during the past year to Japan, China, the Straits, etc., have been as follows: From London, $25,793,207; from Marseilles, $1,128,688; from San Francisco, $14,621,431. Total, $41,543,326, as against $43,006,618 last year.

Exhibit of coinage of gold, silver, and copper in the Republic of Mexico from the 1st of July, 1873, to the 30th of June, 1888.

Years.	Gold dollars.	Silver dollars.	Copper dollars.
1873-1874	866,743	18,846,067	15,966
1874-1875	862,619	19,386,958	31,712
1875-1876	809,401	19,454,054	30,654
1876-1877	695,750	21,415,128	9,035
1877-1878	691,998	22,084,203	41,364
1878-1879	658,206	22,102,987	16,300
1879-1880	521,826	24,018,528	14,035
1880-1881	492,068	24,617,395	42,258
1881-1882	452,590	25,146,360	11,072
1882-1883	407,600	24,083,921	.....
1883-1884	328,698	25,377,379	.....
1884-1885	423,250	25,840,728	.....
1885-1886	425,000	25,850,000	.....
1886-1887	410,000	25,600,000	.....
1887-1888	340,320	26,711,000	.....
Total	8,386,069	350,594,608	203,296

SUMMARY.

Gold	$8,386,069
Silver	350,594,608
Copper	203,296
Grand total	359,183,973

Exhibit of the coinage of Mexico from the establishment of the mints in 1537 to the end of the fiscal year of 1888.

Epoch.	Gold.	Silver.	Copper.	Total.
Colonial.				
Unmilled coin from 1537 to 1731	$8,497,950	$752,007,456	$200,000	$760,705,406
Pillar coin, 1732 to 1771	19,889,014	441,629,211	.....	461,518,225
Bust coin, 1772 to 1821	40,391,447	888,563,989	342,803	929,298,329
	68,778,411	2,082,260,656	542,803	2,151,581,960
Independence.				
Iturbide's Imperial Bust, from 1822 to 1823	557,392	18,575,569		19,132,961
Republic Eagle—1824 to June 30, 1873	45,040,628	740,246,485	5,235,177	790,522,290
	45,598,020	758,822,054	5,235,177	809,655,251
Republic				
Eagle coin from July 1, 1873, to June 30, 1888	8,386,069	350,594,608	203,296	359,183,973

Colonial epoch, from 1537 to 1821, $2,151,581,960; Independence, from 1822 to 1873, $809,655,251; Republic, from 1873 to 1888, $359,183,973. Total, $3,320,421,184.

The exhibits of production and mintage indicate a steady development of the mining interests of the United States of America, and also of Mexico, and, with the increasing facilities of railway communication fostering every department of industry, the outlook for a continued growth in the product of precious metals is flattering.

JOHN J. VALENTINE.

APPENDIX N.

LIST OF AWARDS TO UNITED STATES EXHIBITORS AND COLLABORATORS.

GRAND PRIZES.

Class.	Exhibitor.	Address.	Exhibit.
62	American Bell Telephone Co.....	Boston, Mass	Telephones and appliances.
73	Bergner and Engel Brewing Co...	Philadelphia, Pa.....	Lager beer.
53	Brown and Sharp Manufacturing Co.	Providence, R. I.....	Machine tools.
S. E.*	Bureau of Labor	Washington, D. C.....	National and State reports.
S. E.*	Bureau of Education	....do	Reports on technical education.
7	...do	....do	Reports and monographs.
8	Bureau of Ethnology.....	....do	Reports.
8	Bureau of Education	....do	Reports.
6	Boston Public Schools	Boston, Mass	Text-books and students' work.
9	Century Company.....	New York City	Books and magazines.
43	Department of State	Washington, D. C. ...	Illustration of textile industries.
44	Department of Agriculture.....	....do	Tobaccos.
67	....do	....do	Cereals.
73 *bis*	....do	....do	Native wines.
76	....do	....do	Useful and injurious insects.
62	Edison, Thomas A	Llewellyn Park, N. J..	Electric appliances, telephone, and

List of awards—Grand prizes.

Class.	Exhibitor.	Address.	Exhibit.
8	Smithsonian Institution	Washington, D. C.	Reports, etc.
62	Thomson, Elihu	Lynn, Mass	Inventions pertaining to electricity.
24	Tiffany & Co	New York City	Silverware.
63	United States Corps of Engineers.	Washington, D. C.	Methods of civil engineering.
16	....do	....do	Charts and reports.
12	United States Geological Survey.	...do	Photographic transparencies.
16	... do	....do	Reports and charts.
8	....do	....do	Do.
41	....do	....do	Collection of ores and minerals of the United States.
8	United States Signal Service	....do	Charts, monographs, and instruments.
15	....do	....do	Meteorological instruments.
16	....do	... do	Do.
16	United States Coast and Geodetic Survey.	....do	Charts.
15	United States Naval Observatory.	....do	Time-service, Gardner system.
8	University of the State of New York.	Albany, N. Y.	Reports.
49	Walter A. Wood	Hoosick Falls, N. Y	Harvesters and reapers.
56	Wheeler and Wilson Manufacturing Co.	Bridgeport, Conn	Sewing-machines.
38	Winchester Repeating Arms Co.	New Haven, Conn	Small-arms.
52	Worthington Pumping Machine Co.	New York City	Pumps.

SPECIAL PRIZES—FIELD TRIALS.

Class.	Exhibitor.	Address.	Award.	Exhibit.
49	Whitman Agricultural Co	St. Louis, Mo	Grand prize, object of art.	Steam fodder press.
49	Wood, Walter A., Manufacturing Co.	Hoosick Falls, N. Y.	...do	Reaper and binder.
49	Johnston Harvester Co	Batavia, N. Y.	First prize, gold medal.	Do.
49	McCormick Harvesting Machine Co	Chicago, Ill.	....do	Do.
49	Wood, Walter A., Manufacturing Co.	Hoosick Falls, N. Y.	... do	Mowing-machines.
49	...do	...do	...do	Reaper.
49	Bradley & Co	Syracuse, N. Y	Second prize, silver medal.	Do.
49	Johnston Harvester Co	Batavia, N. Y.	...do	Do.

SPECIAL PRIZES—FOR REPRODUCTIVE ANIMALS.

Horses.	Bennett, E. R	Topeka, Kans.	Silver medal and 400 francs.	Two-year colt.
	do	do	Silver medal and 600 francs.	Three-year stallion.
	do	....do	Silver medal and 500 francs.	Three-year mare.

List of awards—Special prizes.

Class.	Exhibitor.	Address.	Award.	Exhibit.
Horses.	Bennett, E. R	Topeka, Kans.	Bronze medal and 500 francs.	Four-year stallion.
	....do	....do	Bronze medal and 400 francs.	Four-year mare.

SPECIAL PRIZES—FOR PERMANENT COLLECTION.

82	E. B. Fernon	Washington, D. C.	Silver medal	Perishable and evergreen leaves.
82	....do	....do	Mention	Resins in pure grain.

GOLD MEDALS.

Class.	Exhibitor.	Address.	Exhibit.
2	Abbey, E. A	Bedford Gardens, London, England.	Paintings.
8	American Museum of Natural History.	New York City	Reports and bulletins.
52	American Elevator Co	...do	Hydraulic lift.
53	American Screw Co	Providence, R. I	Rolled and swaged wood-screw machines.
59	American Writing-Machine Co	Hartford, Conn	Calligraph writing-machine.
41	Anaconda Mining Co	Montana	Copper ore.
9	Appleton & Co	New York City	Books.
52	Armington & Sons	Providence, R. I	Steam-engines.
70, 71	Armour & Co	Chicago, Ill	Canned and salt meats, soup, and extracts.
12	Barker, George	Niagara Falls, N. Y	Photographic views.
6	Bardeen, C. W., & Co	Syracuse, N. Y	Text books and memory cards.
6	Barnes, A. S., & Co	New York City	Books.

List of awards—Gold medals.

Class.	Exhibitor.	Address.	Exhibit.
73	Commissioner Agriculture, Kans.	Topeka, Kans.	Agricultural reports.
8	Cornell University	Ithaca, N. Y.	Photographs and annual registers.
8	Cope, E. D.	Philadelphia, Pa.	Casts extinct mammals.
28	Colgate & Co	New York City	Soaps and perfumes.
S.E.*	Collective exhibit of the States of California, North Carolina, Florida, Illinois, Maine, Michigan, Missouri, New Hampshire, New York, Pennsylvania, and cities of Buffalo, Cleveland, New York, Pittsburgh, San Francisco, St. Paul, Springfield, Syracuse, and Washington, D.C.		Labor reports and statistics.
38	Colt's Patent Fire Arms Manufacturing Co.	Hartford, Conn.	Fire-arms.
62	Coll Vulcanite Wire Co.	Wilmington, Del.	Insulated wire.
41	Corbin, P. & F.	New York City	Builders' hardware.
44	Cotton-seed Oil Product Co.	do	Oil products.
41	Cowles' Electric Smelting and Aluminum Co.	Lockport, N. Y.	Aluminum alloys, etc.
52	Crosby Steam Gauge and Valve Co.	Boston, Mass	Valves and gauges.
70, 71	Curtis Bros.	Rochester, N. Y.	Canned meats
48	Cyclone Pulverizer Co	New York City	Ore-crusher.
56	Davis Sewing Machine Co	Watertown, N. Y.	Sewing-machines.
15	Darling, Brown & Sharpe	Providence	Instruments of precision.
29	Demuth & Co.	New York	Meerschaum pipes.
41	Delaware and Hudson Canal Co.	do	Coal.
45	Devoe, F. W., & Co	do	Railway varnishes and paints.
6	Department Public Instruction, Iowa.	Des Moines, Iowa	Official documents.
7	do.	do	Do.
6	Department Public Instruction, California.	Sacramento, Cal.	Do.
7	do.	do	Do.
7	Department Public Instruction, Massachusetts.	Boston, Mass	Do.
42	Department Agriculture.	Washington, D. C.	Specimens of woods.
50	do.	do	Methods of farming and food industries.
S.E.*	Department of Labor, Massachusetts.	Boston, Mass.	Reports and statistics.
S.E.*	Department of Labor, New York	Albany, N. Y	Do.
73 cts.	Dodge J. R.	Washington, D. C	Charts and statistics of agriculture.
39	Dunlap, R., & Co	New York City	Hats.
44	Dutton, H. F., & Co.	Gainesville, Fla	Sea Island cotton.
41	Drake Company	Arizona	Petrified wood
12	Eastman Dry Plate and Film Co.	Rochester, N. Y.	Photographic appliances.
6, 7, 8	Eastman Business College	Poughkeepsie, N. Y	Methods, photos, students' work, etc.
6	Educational Publishing Co	Boston, Mass	"Education" and "Common School Education"
6	Elizabeth Public Schools	Elizabeth, N. J.	Students' work, etc.
74	Enterprise Manufacturing Co	Columbiana, Ohio.	Feed grinders.
55	Eureka Fire Hose Co	New York City.	Woven hose
73 cts.	Fernow, E. B	Washington, D. C	Map of forest area, United States.
15	Gardner, William F	Naval Observatory, Washington, D. C	Collaborator

* Social economy

List of awards—Gold medals.

Class.	Exhibitor.	Address.	Exhibit.
30	Garner & Co	New York City	Printed cotton fabrics.
46	....do	....do	Methods of printing and finishing goods.
S.E.*	Gilman, N. C	Boston, Mass	Profit sharing.
24	Gorham Manufacturing Co	New York City	Silverware.
67	Glen Cove Manufacturing Co	....do	Maizena.
69	Green Mountain Stock Farm	West Randolph, Vt	Butter.
1	Harrison, Alexander	Paris	Oil painting.
44	Haas, L. B	Hartford, Conn	Tobaccos.
59	Hammond Type-writer	New York City	Type-writers.
19	Henry, C. Edward	Kokomo, Ind	Opalescent glass.
19	Heidt, Louis	Brooklyn, N. Y	Stained glass.
62	Heisler Electric Light Co	St. Louis, Mo	Dynamo and automatic regulator.
24	Heller	Gorham Manufacturing Co., New York City.	Collaborator.
63	Herring & Co	New York City	Safes.
17	Heywood Bros. & Co	....do	Rattan furniture.
1	Hitchcock, George	Paris	Oil painting.
67	Hill, George W	Department of Agriculture.	Collaborator.
15	Hollerith, Herman	Washington, D. C	Apparatus for compiling statistics.
9	Houghton, Mifflin & Co	Boston, Mass	Books.
50	Howes, Simeon	Silver Creek, N. Y	Milling machinery.
75	Hussman, George	Department of Agriculture.	Collaborator.
6	Indian Industrial School	Carlisle, Pa	Reports, students' work, etc.
48	Ingersoll Rock Drill Co	New York City	Mining appliances.
6	Ivison, Blakeman & Co	....do	Books.
42	Jackson, A. C	Sanford, Fla	Florida woods.
S. E.*	Johns Hopkins University Publication Agency.	Baltimore, Md	Publications.

List of awards—Gold medals.

Class.	Exhibitor.	Address.	Exhibit.
24	Meriden Britannia Co	Meriden, Conn	Plated ware.
6	Merriam, G. C., & Co	Springfield, Mass	Dictionaries.
9	....do	....do	Text-books.
69	Michener, J. H	Philadelphia, Pa	Lard.
70, 71	....do	....do	Cured meats.
73	Montgomery Brewing Company	Montgomery, Ala	Lager beer.
6	Moline Public Schools	Moline, Ill	Scholars' work.
73	Mott, S. R. and T. C	New York City	Cider.
71	Morris & Co	Chicago, Ill	Canned meats.
58	McKellar, Smiths & Jordan	Philadelphia, Pa	Type.
54	National Cordage Co	New York City	Cordage and rope.
6	National Deaf-Mute College	Washington, D. C	Reports and plans.
64	National Soldiers' Home	Hampton, Va	Hospital plans.
S. E.*	Nelson, N. O., Manufacturing Co.	St. Louis, Mo	Report on profit sharing.
41	Nevada Mineral Exhibit	Carson, Nev	Ores and minerals.
56	New Home Sewing Machine Co	New York City	Sewing-machines.
9	New York Bank Note Co	....do	Specimens of engraving.
67	Northern Pacific Railroad Co	....do	Agricultural products.
53	O'Bolger, Thomas (Paine Shoe Lasting Co).	Rochester, N. Y	Collaborator.
6	Ohio Commissioners of Schools	Columbus, Ohio	Text-books.
62	Okonite Company	New York City	Insulated wire.
73	Osborne, Son & Co	Philadelphia, Pa	Whiskey.
52	Otis Brothers & Co	New York City	Gas engines and hydraulic lift.
56	Paine Shoe Lasting Machine Co	Rochester, N. Y	Lasting machine.
67	Pillsbury, C. A., & Co	Minneapolis, Minn	Official grades of wheat flour in different stages.
45	Pease, F. S	Buffalo, N. Y	Lubricating oils.
6	Perkins' Institute for the Blind	Boston, Mass	Scholars' work, etc.
6	Pittsburgh Public Schools	Pittsburgh, Pa	Do.
6	"Popular Educator"	Boston, Mass	Volumes.
43	Plant System of Railways	Tampa, Fla	Products fishing and hunting.
11	Prang & Co	Boston, Mass	Chromolithographs.
7	Public Schools of Galveston	Galveston, Tex	Reports and methods.
7	Public Schools of Boston	Boston, Mass	Do.
7	Public Schools of Pittsburgh	Pittsburgh, Pa	Do.
41	Randal, J. B	San Francisco, Cal	Quicksilver ores.
2	Reinhart, C. S	Paris	Paintings.
45	Revere Rubber Co	Boston, Mass	Rubber goods.
59	Remington Standard Type writer	Ilion, N. Y	Type-writer.
71	Richmond Cedar Works	Richmond, Va	Churns.
53	Brown, Sharpe & Co	do	Collaborator.
20	Rookwood Pottery	Cincinnati, Ohio	Artistic pottery.
12	Rowland, Henry A	Baltimore, Md	Photographs of spectrums.
73 ?cs	Saunders, Wm	Dept. Agriculture	Plans of gardens, etc.
53	Sellers, Wm	Philadelphia, Pa	Collaborator.
53	Sellers, John B	do	Do.
6	Silver, Burdette & Co	Boston, Mass	Music publications
56	Singer Sewing Machine Co	New York	Sewing-machines.
53	Simonds, Geo. F	Fitchburg, Mass	Metal rolling machine.
36	Schloss, N. J., & Co	New York City	Children's clothing.
38	Smith & Wesson	Springfield, Mass	Fire-arms.
50	Smith Middlings Purifier Co	Jackson, Mich	Flour dressers, etc.
6	Sockanossett School for Boys	Howard, R. I	Text-books and students' work.
45	Solway Process Co	Syracuse, N. Y	Soda
44	Southern Cotton Seed Oil Co	New York City	Oil.

*Social economy

List of awards—Gold medals.

Class.	Exhibitor.	Address.	Exhibit.
56	Société Anonyme pour l'Exploitation des Brevets (Mackay and Copeland).	Paris	Lasting machines.
62	Sprague Electric Railway and Motor Co.	New York City	Electric railway motors.
52	Straight Line Engine Co	Syracuse, N. Y	Steam-engine.
6	State Department of Education	Harrisburg, Pa	Annual reports.
53	Stiles & Parker Press Co	Middletown, Conn	Drop-hammers, presses, and dies.
70, 71	Swift & Co	Chicago, Ill	Salt, packed, dried, salted, and smoked meats.
11	Tiffany & Co	New York City	Heraldic engraving.
29	....do	....do	Leather goods.
37	...do	....do	Jewelry.
43	..do	... do	Shells.
8	United States Naval Academy	Annapolis, Md	Text-books.
36	United States Quartermaster's Department.	Washington, D. C	Uniforms Continental soldiers.
76	United States Entomological Exhibit.	Department of Agriculture.	Economic entomology.
38	Union Metallic Cartridge Co	Bridgeport, Conn	Cartridges.
8	University of Virginia	Charlottesville, Va	Text-books, photographs, etc.
12	University of California	Berkeley, Cal	Photographs of the moon.
S. E.*	Universal Peace Union	Philadelphia, Pa	Pamphlets, illustrations, etc.
1	Vail, Eugene L	Paris	Oil painting.
45	Valentine & Co	New York City	Carriage varnishes and paints.
44	Vaughan & Sarvay	Richmond, Va	Tobaccos.
62	Volta Graphophone Co	New York City	Graphophones.
10	Warren, S. D., & Co	Boston, Mass	Fine printing papers.
1	Weeks, E. L	Paris	Oil painting.
S. E.*	Wells, David	New York	Reports on Practical Economy
62	Western Electric Co	Chicago, Ill	Electric appliances.
73	Wetmore, Chas. A	Livermore, Cal	Wines.
52	Wheelock, Jerome	Worcester, Mass	Engine system.
56	White Sewing Machine Co	Cleveland, Ohio	Sewing machines.

List of awards—Silver medals

Class.	Exhibitor.	Address.	Exhibit.
41	American Bit Brace Co	Buffalo, N. Y	Mechanical tools.
6	American Journal of Education	St. Louis, Mo	Periodical.
63	American Road Machine Co	Kennett Square, Pa	Road machines.
8	American School at Athens, Greece.	Athens, Greece	Reports.
53	American Tool and Machine Co	Boston, Mass	Screw-cutting lathes.
8	Amherst College	Amherst, Mass	Catalogues, reports, etc.
69	Armour & Co	Chicago, Ill	Lard.
49	....do	....do	Fertilizers.
30	Atlantic Cotton Mills	Lawrence, Mass	White cotton goods.
73 *ter.*	Atwater, W. O	Washington, D. C	Plans and reports on agricultural colleges, etc.
11	Baldwin, Gleason & Co	New York City	Steel prints, etc.
9	Barnes, A. S., & Co	....do	Books.
9	Barrie, George	Philadelphia, Pa	Do.
73	Beck, Adolph	San Francisco, Cal	Wines.
47	Bentz, Dietsch & Betz	Newark, N. J	Leather.
27	Bernales (de) & Co	New York City	Lamps.
6	Betz, Carl	Kansas City, Mo	Text-books.
73	Berringer Bros	St. Helena, Cal	Wine.
48	Blake, Theo. A	New Haven, Conn	Jaw crusher.
53	Bliss, E. W., & Co	New York City	Drop-hammers, presses, and dies.
2	Blume, R. F	....do	Painting.
33	Bohmann, Joseph	Chicago, Ill	Musical instruments.
1	Boggs, Frank M	Paris	Oil painting.
72	Bolen & Byrne	New York City	Aerated beverages.
45	Borne, Scrymoci & Co	....do	Oils.
44	Bowman, N. R	Lynchburgh, Va	Tobaccos.
44	Boyce, S. S	New York City	Hemp and flax.
1	Bridgman, F. A	Paris	Oil painting.
45	Brown, B. F., & Co	Boston, Mass	Blacking.
70, 71	Brougham, George	Chicago, Ill	Meat extracts and soups.
17	Brunswicke, Balke & Collender	New York City	Billiard tables.
6	Buffalo Public Library	Buffalo, N. Y	Catalogue.
19	Buffalo Stained Glass Works	do	Glass.
47	Burk Brothers	Philadelphia, Pa	Leather.
67	Butler, A. P	Columbia, S. C	Rice—processes.
10	Carter, Dinsmore & Co	Boston, Mass	Inks.
57	Casey Machine Supply Co	New York City	Nailing machines.
69	Cassard, G., & Son	Baltimore, Md	Lard.
49	Chadborn & Coldwell Manufacturing Co.	Newburgh, N. Y	Lawn mowers.
1	Chase, William M	New York City	Oil painting.
16	Chamberlain, T. C	Madison, Wis	Surveys, reports, etc.
6	Christiansen Institute	Brooklyn, N. Y	Scholars' work.
12	Clark, D. R	Chicago, Ill	Photographs.
44	Clark, Washington A	Columbia, S. C	Sea island cotton.
59	Clough & McConnell	New York City	Wire cork-screw machine
5	Closson, W. B	do	Engravings.
6	Colorado Institute for Deaf and Blind	Colorado Springs, Col	Photographs and scholars' work
50	Columbia Typewriter Co	New York City	Type writers.
8	College Physicians and Surgeons	Baltimore, Md	Text books and monograph.
16	Colvin, Verplank	Albany, N. Y	Reports and surveys.
6, 7, 8	Cooper Union	New York City	Catalogues and reports, etc.
12	Coolidge, Baldwin	Boston, Mass	Photographs.

List of awards—Silver medals.

Class.	Exhibitor.	Address.	Exhibit.
62	Commercial Cable Co.	New York and Paris.	Telegraph apparatus.
62	Consolidate Telegraph and Electrical Subway Company.	New York City	Electrical subways.
60	Connor, W. R.	Healey & Co., New York City.	Collaborator.
63	Corbin, P., & F.	New Britain, Conn.	Builders' hardware.
S. E.*	Cornell University	Ithaca, N. Y	Reports on technical education.
16	Cook, G. H.	New Brunswick, N. J.	Surveys.
45	Cotton-seed Oil Product Co.	New York City	Soaps.
70, 71	Cowdry, E. J., & Co.	Boston, Mass.	Canned meats.
24	Curran, John T	Tiffany & Co., New York City.	Collaborator.
45	Coxwell	Solway Process Co., Syracuse, N. Y.	Do.
53	Dake, Charles	American Screw Co., Providence, R. I.	Do.
76	Dadant & Son	Hamilton, Ill.	Bee-keeping appliances.
5	Davis, T. P.	New City	Engravings.
1	Davis, C. H.	St. Legere, France	Oil painting.
60	Dann Bros. & Co.	New Haven, Conn	Bent carriage wood.
32	Department of Agriculture	Washington, D. C.	Wool.
70, 71	....do	....do	Pomology.
S. E.*	Department of Labor, Connecticut	Hartford, Conn.	Reports and statistics.
S. E.*	Department of Labor, Illinois	Springfield, Ill	Do.
S. E.*	Department of Labor, Rhode Island.	Providence, R. I.	Do.
S. E.*	Department of Labor, Ohio.	Columbus, Ohio.	Do.
S. E.*	Department of Labor, Iowa	Des Moines, Iowa	Do.
S. E.*	Department of Labor, Kansas	Topeka, Kans	Do.
S. E.*	Department of Labor, Michigan.	Lansing, Mich	Do.
6	Department of Public Instruction, Dakota.	Dakota	Annual reports.
6	Department of Public Instruction, Rhode Island.	Providence, R. I.	Do.

List of awards—Silver medals.

Class.	Exhibitor.	Address.	Exhibit.
37	Farnham, Paul	Tiffany & Co., New York City.	Collaborator.
59	Fenwick, Charles	American Writing Machine Co., New York City.	Do.
39	Folding Trunk Co	New York City	Trunks.
35	Follmer, Clogg & Co	....do	Umbrellas.
41	Foote, A. E	Philadelphia, Pa	Minerals.
70, 71	Franco-American Soup Co	New York City	Soups.
36	Franklin & Co	....do	Boys' costumes.
6, 7, 8	Free Evening Industrial School	Boston, Mass	Students' work.
14	Frees, C. A	New York City	Artificial limbs, etc.
36	Friedlander, A., & Co	....do	Cloaks.
1	Gay, Walter	Paris	Oil painting.
73 *bis*	Galloway, B. T	Washington, D. C	Vegetable pathology.
6	Galveston Public Schools	Galveston, Tex	Papers, charts, and scholars' work.
9	Gebbie & Co	Philadelphia, Pa	Books.
9	Gebbie & Hasson	....do	Photo-engravings.
7	Ginn & Co	Boston, Mass	Text-books.
9	....do	....do	Educational books.
58	Golding & Co	Boston, Mass	Printing presses.
29	Gorham Manufacturing Co	New York City	Fancy articles.
73	Greenbaum, Alfred	San Francisco, Cal	Wines.
19	Greenough, Walter C	New York City	Stained glass.
12	Guerin, F. W	St. Louis, Mo	Photographs.
S. E.*	Hadley, Arthur	Yale College, New Haven.	Wines.
73	Hagen, Henry	Cedar Knoll, Napa, Cal.	Brandies.
73	....do	....do	Wines.
16	Hall, James H	Albany, N. Y	Geological surveys.
73	Haraszthy, Arpad & Co	San Francisco	Wines.
18	Hartford Woven Wire Mattress Co.	Hartford, Conn	Mattresses and iron bedsteads.
44	Harthill, Alex	Louisville, Ky	Tobaccos.
1	Harrison, Birge	Paris	Oil painting.
7	Heath, D. C., & Co	Boston, Mass	School and college text-books.
19	Healey & Millet	Chicago, Ill	Stained glass.
50	Heine, Arguste	Silver Creek, N. Y	Milling machinery.
26	Heinrich, H. H	New York City	Chronometers.
44	Hinson, W. O	James Island, S. C	Sea island cotton.
1	Howe, W. H	Paris	Oil painting.
6	Home for Feeble-minded Children	Santa Clara, Cal	Scholars' work.
73	Hooper, George F	Sonoma, Cal	Wines.
42	Hough R B	Low ville, N. Y	Veneers.
S. E.*	Houghton, Mifflin & Co	Cambridge, Mass	Publications.
57	Huff, C F H	A. J. Fay & Co., Cincinnati, Ohio.	Collaborator.
73	Hume & Co	Washington, D. C.	Whiskey.
6	Hyatt School Slate Co	Bethlehem, Pa	School slates.
9	Ivison, Blakeman & Co	New York City	Books.
74	Jackson, Arthur	Sanford, Fla	Florida products.
59	Jenne	Remington Standard Type-Writer, Ilion, N. Y.	Collaborator.

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List of awards—Silver medals.

Class.	Exhibitor.	Address.	Exhibit.
9	Johns Hopkins University Publication Agency.	Baltimore, Md	Books and periodicals.
56	Johnson, Alfred	Paris	Sewing machines.
49	Johnston, Samuel, & Co	Brockport, N. Y	Agricultural implements.
67	Kern, M. J	Department of Agriculture.	Collaborator.
60	Kimball, C. P., & Co	Chicago, Ill	Carriages.
44	Kimball, W. S., & Co	Rochester, N. Y	Cigarettes and smoking tobaccos.
1	Knight, D. R	Poissy, France	Oil painting.
73	Kohler & Frohling	San Francisco, Cal	Wine and brandy.
43	Kunz, George F	Tiffany & Co., New York City.	Collaborator.
7	Lake Erie Seminary	Painesville, Ohio	Choral music, catalogues, etc.
59	Lampson Consolidated Store Service.	New York City	Knox check and adding machine.
59	Leinbach, Felix W	Bethlehem, Pa	Paper-bag machine.
53	Lervis, Wilfred	William Sellers & Co., Philadelphia, Pa.	Collaborator.
9	Lothrop, D., & Co	Boston, Mass	Books.
3	Low, W. H	New York City	Painting.
11	Lowell, John & Co	Boston, Mass	Engravings.
28	Lorenz, George	Toledo, Ohio	Perfumes.
49	Lloyd & Supplee	Philadelphia	Lawn mowers.
35	Lyon, Amasa, & Co	New York City	Umbrellas.
1	MacEwen, Walter	Paris	Oil painting.
57	McCoy, James S	New York City	Pneumatic tool.
25	McLoughlin, Louise H	Cincinnati, Ohio	Répoussé work.
76	McLean, N. W	Department of Agriculture.	Collaborator.
8	Massachusetts College of Pharmacy.	Boston, Mass	Course of study and students' works.
42	Massachusetts Society for the Promotion of Agriculture.	do	Michaux's forest flora.

List of awards—Silver medals.

Class.	Exhibitor.	Address.	Exhibit.
6	Ohio Institute for Feeble-minded Youth.	Columbus, Ohio	Views and pupils' work.
41	Ontario Mining Co	Park City, Utah	Silver, gold, and lead ores.
49	Osborn, D. M., & Co	Auburn, N. Y	Harvesting machinery.
70, 71	Pacific Orchard Cannery	San José, Cal	Canned fruits and fruits in brandy.
53	Parks, H	Brown & Sharpe Manufacturing Co., Providence, R. I.	Collaborator.
S. E.*	Peacedale Manufacturing Co	Peacedale, R. I	Charts and documents relating to profit-sharing.
75	Pearson, Alexander W	Department of Agriculture.	Collaborator.
61	Peckham Street Car Wheel and Axle Co.	New York City	Wheels and axles.
6	Pennsylvania Training School	Elwyn, Pa	Annual reports.
6	Pennsylvania Oral Training School for the Deaf.	Scranton, Pa	Do.
8	Philadelphia College of Pharmacy	Philadelphia, Pa	Charts, text-books, etc.
78	Pleasant Valley Wine Co	Rheims, N. Y	Wine.
6	Poughkeepsie Public Library	Poughkeepsie, N. Y	Reports, manuals, and catalogues.
6	Pratt, D. C	New York City	School appliances.
6	Public Schools of	Columbus, Ohio	Reports, etc.
6	....do	Cincinnati, Ohio	Do.
6	....do	Chicago, Ills	Do.
6	....do	Cambridge, Mass	Do.
6	....do	New Haven, Conn	Do.
6	....do	Sandusky, Ohio	Do.
16	Rand, McNally & Co	Chicago, Ill	Maps, atlases, etc.
11	Rath, A	New York City	Vignettes on stone.
74	Reid, A. H	Philadelphia, Pa	Dairy appliances.
1	Reinhart, C. S	Paris	Oil-painting.
2	Remington, Fred	New York City	Painting.
44	Roberts, R. R	Washington, D. C	Flax and hemp.
70, 71	Richardson & Rollins	Dover, Del	Canned meats.
28	Rickseecker, Theo	New York City	Perfumes.
44	Riley, C. V	Department of Agriculture.	Collaborator.
27	Rochester Lamp Co	New York City.	Lamps.
2	Rolshoven, Julius	Paris	Painting.
70, 71	Rosa, John J	Milford, Del	Evaporated peaches.
35	Roth & Goldschmidt	New York City	Corsets.
42	Rothrock, J. P	Philadelphia	Photographs of trees.
69	Salmon, D. E	Department Agriculture.	Coll. exhibit of butter and cheese.
73 *bis*	do	....do	Charts of animal food industries.
42	Sargeant, Chas S	Jamacia Plains, Mass	Sections of trees.
6	"School Journal"	New York City	Educational periodical.
12	Scholten	St Louis, Mo	Photographs.
67	Schumaker, A. T., & Co	Akron, Ohio	Finished cereal products.
73	Schilling, C., & Co	San Francisco, Cal	Wines.
13	Seabury & Johnson	New York City	Pharmacopœial plasters.
45	do	....do	Hydropathic.
35	Seigel Brothers	....do	Ladies' and misses' underwear.
36	Sendker, A. H	Buffalo, N. Y	Shoes.

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List of awards—Silver medals.

Class.	Exhibitor.	Address.	Exhibit.
26	Seth Thomas Clock Co	Thomaston, Conn	Clocks.
60	Shepard, H. G., & Sons	New Haven, Conn	Bent carriage wood-work.
2	Sherwood, Rosina Emmet	New York City	Painting.
36	Shillaber & Co	Lynn, Mass	Shoes.
44	Sioux City Linseed Oil Works	Sioux City, Iowa	Oil, meal, and cake.
27	Simpson, L. H	Paris	Stove.
6	Somerville Public Library	Somerville, Mass	Reports and catalogue.
69	Southern Cotton-Seed Oil Co	New York City	Oil.
62	Sperry Electric Co	Chicago, Ill	Electric-light plant.
6	State Dept. Public Instructions	Lansing, Mich	Reports.
10	Stafford, L. S	New York City	Ink.
12	Stein, S. L	Milwaukee, Wis	Photographs.
8	Stevens Institute Technology	Hoboken, N. J	Views and publications.
53	Sternley, J. H., & Son	Reading, Pa	Bolt and screw machines.
73	Stone Hill Wine Co	Hermann, Mo	Wines.
7	St. Stanislaus Commercial College	Bay St. Louis, Mo	Students' work.
6	Supt. Public Instruction	Denver, Col	Biennial reports.
6	Supt. Education	Baltimore, Md	Reports and scholars' work.
6	Syracuse Academy	Syracuse, N. Y	Reports and catalogue.
12	Tabor, H	San Francisco, Cal	Photographs.
53	Tanite	Stroudsburgh, Pa	Emery wheels.
73 *ter*	Taylor, L	Washington, D. C	Micrographic illustrations of animal fats.
S. E.*	Tenement-House Building Co	New York City	Plans for dwellings.
15	Thatcher, Edwin	Decatur, Ala	Slide-rule.
52	Thomson, John	New York City	Water meters.
58	....do	... do	Printing presses.
58	Thorne Type-Setting Machine	Hartford, Conn	Type-setting machine.
19	Tiffany & Co	New York City	Decorative glass.
S. E.*	Training School for Nurses	....do	Methods and reports.
52	Underwood Manufacturing Co	Tolland, Conn	Inks, mucilage, etc.
8	University of Illinois	Urbana, Ill	Reports.
45	Upton, Geo.	Boston, Mass	Glue and sand-paper.

List of awards—Silver medals.

Class.	Exhibitor.	Address.	Exhibit.
24	Wilkinson, George	Gorham Manufacturing Co., New York City.	Collaborator.
44	Wilson, J. J., Son & Co	Richmond, Va	Tobacco.
30	Willimantic Linen Co	Willimantic, Conn	Spool thread.
16	Winchell, W. H.	Minneapolis, Minn.	Surveys.
73	Wineberger, Mrs. J. C.	St. Helena, Cal	Wines.
6	Woburn Public Library	Woburn, Mass	Reports and photographs.
6	Woburn Public Schools	....do	Reports and scholars' work.
59	World Type-Writer Co	New York City	Type-writer.

BRONZE MEDALS.

41	Abraham, L. C., & Bros	Cleveland, Ohio	Wire brushes.
41	Adams, J. S., & Co	Canaan, Conn	Magnesian limestone.
73	Adamson, Rutherford	Napa, Cal	Wines.
5	Aikman, W. W	New York City	Wood engravings.
41	Alice Gold and Silver Mining Co	Walkerville, Mont	Silver and gold ores.
6, 7, 8	Alabama Polytechnic Institute	Auburn, Ala	Catalogues, scholars' works.
1	Allen, W. S.	New York City	Oil-painting.
52	American Leather Link Belt Co	....do	Belting.
73	American Wine Co	St. Louis, Mo	Wines.
50	Armiger, R., & Sons	Baltimore, Md	Refrigerators.
41	Ausable Horse-shoe Nail Co	New York City	Horse-shoe nails.
51	Bailey Wringing Machine Co	Woonsocket, R. I	Wringers.
9	Baird, Carey & Co	New York City	Books.
46	Bancroft & Bloede	Rockford, Del	Window-shades.
1	Beckwith, T. C	New York City	Oil-painting.
51	Bentzen, Charles A	....do	Washing-machines.
1	Bell, Ed. A	Paris	Oil-painting.
45	Bell, R. W., Manufacturing Co	Buffalo, N. Y	Soaps.
49	Benson, Egbert	Raritan, N J	Cultivators.
6	Berkeley School	New York City	Reports, catalogues, etc.
29	Bissell Carpet Sweeper	Grand Rapids, Mich	Carpet-sweepers.
41	Biber, J. M	Carson City, Nev	Ores.
1	Blashfield, E. H	New York City	Oil-painting.
1	Blum, R. F	....do	Do.
49	Bradley & Co	Syracuse, N. Y	Mowers and reapers.
45	Brookhaven Rubber Co	Setauket, R. I	Crude rubber and products.
1	Brandagee, R. M	New York City	Oil-painting.
73	Brun, A., & Co	Oakville, Cal	Wines.
1	Butler, Howard Russell	New York City	Oil-painting.
41	Cactus Mining Co	Utah	Ores.
41	Capitol Manufacturing Co	Chicago, Ill	Wrenches.
29	Castle Carpet Sweeper	New York City	Carpet-sweepers.
10	Caws Ink and Pen Co	....do	Ink.
S. E.*	Century Co	....do	Publications.
41	Cleveland Tin Mining Co	Deadwood, Dak	Ores.
76	Cook, H. I	Department of Agriculture.	Collaborator.
74	Cooley System	....do	Dairy appliances.
1	Coffin W. A	New York City	Oil painting.
8	College of New Jersey	Princeton, N. J	Catalogue.
41	Comet Mining Co.	Frisco, Utah	Ores.

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List of awards—Bronze medals.

Class.	Exhibitor.	Address.	Exhibit.
52	Colt's Patent Fire Arms Manufacturing Co.	Hartford, Conn	Steam-engine.
42	Cordley & Hayes	New York City	Indurated fiber ware.
73	Courtois, V	St. Helena, Cal	Wines.
1	Cox, Kenyon	New York City	Oil-painting.
2	do	do	Painting.
60	Chapman Manufacturing Co	Meriden, Conn	Sleigh bells and plumes.
73	Crabb, H. W	Oakville, Cal	Wines.
73	Craig, W. O	Sonoma, Cal	Do.
53	Curtis & Curtis	Bridgeport, Conn	Die-stocks and threading-machines.
17	Cutler & Son	Buffalo, N. Y	Desks.
72	Dadaut, Charles, & Son	Hamilton, Ill.	Wine and vinegar from honey.
1	Dana, W. P. W	Paris	Oil-painting.
43	Davidson, H. G	Boston, Mass	Stuffed fish.
36	Dellac, Madame	New York City	Costumes.
1	Delachaux, L. D	Paris	Oil-painting.
6	Department of Public Instruction, New Hampshire.	Concord, N. H	Reports.
6	Department of Education	Columbia, S. C	Do.
6	Department of Public Instruction, Texas.	Austin, Tex	Do.
6	Department of Public Instruction, Oregon.	Portland, Oregon	Do.
76	Demaree, G. W	Department of Agriculture.	Collaborator.
41	Dickerson Luckasunny Mining Co.	Dover, N. J	Ores.
1	Dodge, W. L	Paris	Oil-painting.
52	Dodge Manufacturing Co	Mishawaka, Ind	Wooden pulleys.
73	Edge Hill Wine Co	St. Helena, Cal	Wines.
6	Educational News	Philadelphia, Pa	Educational publication.
62	Electrical Supply Co	Chicago, Ill.	Electrical appliances.
52	Emerson & Midgely	Beaver Falls, Pa	Belting and hose.

List of awards—Bronze medals.

Class.	Exhibitor.	Address.	Exhibit.
1	Gardner, Miss E. J	Paris	Oil-painting.
1	Gifford, R. S	New Jersey	Do.
26	Giles, F. S	Chicago, Ill	Anti-magnetic watch cases.
40	Gendron Iron Wheel Co	Toledo, Ohio	Children's carriages.
44	Griffin, S. M., & Co	Richmond, Va	Tobaccoes.
70, 71	Griffin Canning Co	Griffin, Ga	Canned tomatoes.
50	Goulds Manufacturing Co	Seneca Falls, N. Y	Pumps.
73	Gundlach, J., & Co	San Francisco, Cal	Wines.
1	Gutherz, Carl	Paris	Oil-painting.
59	Hall Type Writer Co	New York City	Type-writer.
41	Harney Peak Tin Mining Co	Harney Peak, Dak	Ore.
1	Hart, J. M	New York City	Oil-painting.
41	Hartman Manufacturing Co	....do	Wire goods.
41	Hartshorn, Stewart	East Newark, N. J	Shade rollers.
1	Hassam, Childe	Paris	Oil-painting.
76	Heddon, James	Department of Agriculture.	Collaborator.
72	Heinz, H. T., & Co	Pittsburgh, Pa	Preserves.
69	Hooper, George F	Sonoma, Cal	Olive oil.
50	Honiss, W. H	Bethlehem, Pa	Collaborator.
29	Horsey Manufacturing Co	Utica, N. Y.	Felt tooth polishers.
9	Howard Lockwood & Co	New York City.	Books.
29	Howard Strop Co	Charlestown, Mass	Razor strops.
74	Howe, Leroy	Washington, D. C.	Horse-stall mats.
36	Hough & Ford	Rochester, N. Y	Shoes.
70, 71	Huckins, J. H. W., & Co	Boston, Mass	Canned soups.
24	Hughes, William	Gorham Manufacturing Co., New York City	Collaborator.
70, 71	Humbert, Henry & Co	New York City	Meat extracts.
6	Illinois School Journal	Bloomington, Ill	Publications.
1	Innes, George	New York City	Oil-painting.
6	Intelligencer, The	Chicago, Ill	Periodical.
54	International Wool Improvement Co.	Boston, Mass	Flush and flume systems.
53	Jackson, Theodore	New York City	Diamond stone-cutting saw.
1	Johnson, Eastman	...do	Oil-painting.
1	Jones, H. Bolton	....do	Do.
24	Jordan (Gorham Manufacturing Co.)	... do	Collaborator.
3	Kitson, H. H	Anvers	Sculpture.
24	Kittell, Rudolph (Tiffany & Co.)	New York City	Collaborator.
1	Klumpke, Mrs. Annie E	Paris	Oil painting.
41	Knapp, J. C. D	Minneapolis, Minn	Medicinal vaporizers.
41	Knowd, John J	Philadelphia, Pa	Horse shoes.
73	Krug, Chas	St. Helena, Cal	Wines and brandies.
61	Laird, B. F	Covington, Ky	Car coupler.
12	Landy, James	Cincinnati, Ohio	Photographs.
6, 7, 8	Lehigh University	Bethlehem, Pa	Publications, ; reports, and catalogues.
45	Lepage Glue Co	Boston, Mass	Glue.
9	Lindsay, Robert M	Philadelphia, Pa	Books.
50	Lorenz, W. R	Bethlehem, Pa	Collaborator.
30	Low, J. G. and J. F	Chelsea, Mass	Art tile work.
70, 71	Mallory, E. B., & Co	Baltimore, Md	Canned fruits and vegetables.
28	Mann, C. H., & Co	New York City	Perfumery.

List of awards—Bronze medals.

Class.	Exhibitor.	Address.	Exhibit.
12	Marx, Ernest	Plainfield, N. J	Instantaneous photographs.
17	Marks Adjustable Folding Chair Co.	....do	Folding chairs.
60	Martin & Martin	...do	Harness.
70	Martin, Wagner & Co	Baltimore, Md	Canned fruits and vegetables.
52	Mason, Volney, W., & Co	Providence, R. I	Hoisting machinery.
37	Mason, John (Tiffany & Co)	New York City	Collaborator.
73	Matthews, J	Napa, Cal	Wines.
9	McClurg, A.G., & Co	Chicago, Ill	Books.
44	McDonald, A	Department Agriculture.	Collaborator.
45	McLeish & Co	Buffalo, N. Y	Gelatine.
61	Merchants' Despatch Transportation Co.	New York City	Refrigerator car.
17	Merklin Brothers	....do	Furniture.
27	Michigan Radiator Manufacturing Co.	Detroit, Mich	Radiators.
41	Miller Lock Co	Philadelphia, Pa	Locks.
6	Minnesota School for Deaf-Mutes	Faribault, Minn	Reports and methods.
1	Minor, R. C	New York City	Oil-painting.
1	Moore, H. H	Paris	Do.
76	Murphy	Department Agriculture.	Collaborator.
70,71	Myer, Thomas J., & Co	Baltimore, Md	Canned fruits and vegetables.
76	Newcomb, E. R	Pleasant Valley, N. Y.	Bee-keeping appliances.
76	Newman & Sons	Department Agriculture.	Collaborator.
61	New York Commercial Co	New York City	Railroad supplies, etc.
65	Norton	Boston, Mass	Yacht *Neversink*.
44	Nye, William	New Bedford, Mass	Animal oils.
6	Ohio Educational Monthly	Akron, Ohio	Publications.
9	Orange Judd Co	New York City	Books.
19	Pacific Art Glass Works	San Francisco, Cal	Stained glass.

List of awards—Bronze medals.

Class.	Exhibitor.	Address.	Exhibit.
52	Reid, J. Van D	New York City	Belting and hose.
1	Richards, W. T	do	Oil-painting.
69	Rixford, G. P	San Francisco, Cal	Olive oil.
76	Root, A. I	Department Agriculture.	Collaborator.
28	Rottenstem, Dr. J. B	Paris	Tooth-powder.
45	Russia Cement Co	Gloucester, Mass	Fish-glue.
73	Russon, A	Proffit, Va	Wines.
73	Ryckman, G. F	Brockton, N. Y	Do.
52	Scheiren, Charles A	New York City	Leather belting.
57	Schwal, Ernest	Chicago, Ill.	Wood-working machinery.
70, 71	Sears & Nichols	Chillicothe, Ohio	Canned corn and peaches.
12	Seavey, Lafayette W	New York	Photographs.
60	Secco, Henry	New York City	Carriage jacks.
24	Sevambry, Godfrey (Tiffany & Co.)	New York City	Collaborator.
41	Shepard, Sydney & Co	Buffalo, N. Y	Household novelties.
52	Silver & Deming	Salem, Ohio	Pumping machinery.
1	Simmons, E. E	London, Eng	Oil-painting.
52	Slater, Frank	Fitchburg, Mass	Pantograph.
41	Smith, John E., & Sons	Buffalo, N. Y	Meat-choppers.
50	do	do	Feed-cutters.
57	Smith, W. A. (A. J. Fay & Co.)	Cincinnati, Ohio.	Collaborator.
12	Society of Amateur Photographers.	New York City	Photographs.
62	Solar Carbon Manufacturing Co	Pittsburgh, Pa	Carbons.
48	Sperry, Elmer A	Chicago, Ill	Electric-light plant.
45	Sphincter Grip Hose Co	New York City	Hose
38	Standard Target Co	Cleveland, Ohio	Target traps.
41	Stanley Rule and Level Co	New Britain, Conn	Carpenters' tools.
1	Story, J. R	Paris	Oil-painting.
8	St. John's College	Annapolis, Md	Course of study and catalogue.
44	Straiton & Storm	New York City	Cigars.
67	Street, A. S., & Co	New Haven, Conn	Cereal products.
44	Stubbs, Prof. W. C	Baton Rouge, La	Cotton in seed.
1	Thayer, A. H	Boston	Oil-painting.
1	Thompson, Wordsworth	Baltimore, Md	Do.
44	Thornton, Noble & Davis	Richmond, Va	Tobaccos.
12	Thors	San Francisco, Cal	Photographs.
6	The Teacher	New York City	Periodical.
26	Tiffany & Co	do	Hall clocks.
1	Truesdell, E. S.	Ecouen, France	Oil painting.
73	Turk, T. de	Santa Rosa, Cal	Wines and brandies.
1	Ulrich, C. F	Venice	Oil-painting.
10	Underwood, John & Co	New York City	Inks and mucilage.
52	United States Metallic Packing Co.	Philadelphia, Pa	Packing, oil cups, etc.
73	University of California	Berkeley County, Cal.	Wines
9	University Publishing Co	New York City	Books
76	Van Dusen, J. H	Department Agriculture	Collaborator.
6	Van Norman Institute	New York City	Reports, catalogues.
44	Vasey, George	Department Agriculture	Collaborator.
8	Vassar College	Poughkeepsie, N. Y	Course of study, catalogues, etc.
51	Vizet, V	New Rochelle, N. Y	Washing-machines.
1	Vonnoh, Robert H	Paris	Oil-painting.

List of awards—Bronze medals.

Class.	Exhibitor.	Address.	Exhibit.
1	Walker, Horatio	New York City	Do.
10	Waterman, L. E., & Co	... do	Pens.
2	Wier, I. A	....do	Painting.
22	Wemple, J. C., & Co	....do	Window-shades.
46	Wiggin's Sons, H. B	....do	Window-shade fabrics.
72	Wilbur, H. O., & Son	Philadelphia, Pa	Confectionery.
72	Wiley, H. W	Washington, D. C	Sorghum sugar industry.
70, 71	Winterport Packing Co	Winterport, Me	Canned sweet-corn.
S.E.*	Yale and Towne Manufacturing Co.	Stamford, Conn	Post-office system.

HONORABLE MENTION.

3	Adams, S. H	Paris	Plaster bust.
72	Adams & Sons	Brooklyn, N. Y	Chewing-gum.
41	Adirondack Pulp Co	Troy, N. Y	Talc.
65	Allen, Frederic S	Cuttyhunk Island, Mass.	Lifeboat.
9	American Bookmaker	New York City	Publications.
35	American Braided Wire Co	Philadelphia, Pa	Mattresses, pillows, etc.
8	American Numismatic and Archæological Society.	New York City	Proceedings and catalogues.
45	Armour & Co.	Chicago, Ill	Glue, bone-meal.
9	Armstrong & Knauer	New York City	Directories.
69	Bagnoli, Luidi	California	Olive oil.
38	Bailey, Farrel & Co	Pittsburgh, Pa	Automatic cartridge-loaders.
29	Bailey, C. J., & Co	Boston, Mass	Brushes.
9	Bardeen, C. M., & Co	Syracuse, N. Y	Books.
12	Beal, J. H	New York	Photographic views.
73	Ben Lomond Wine Co	Santa Cruz, Cal	Wines.
7	Betz, Carl	Kansas City	Gymnastic text-books and apparatus.

List of awards—Honorable mention.

Class.	Exhibitor.	Address.	Exhibit.
52	Chicago Raw Hide Manufacturing Co.	Chicago, Ill	Belting.
70, 71	Claggett, F	Upper Marlborough, Md.	Canned vegetables.
45	Collins, S., & Son	New York City	Printing inks.
72	Conway Springs Co	Conway Springs, Kans.	Sorghum sugar.
41	Copper Basin Mining Co	Prescott, Ariz	Ores.
12	Cox, G. C	New York City	Photography.
44	Crawford, E. M	Department of Agriculture.	Tobaccos.
1	Curtis, Ralph	Paris	Oil-painting
8	Dartmouth College	Hanover, N. H	College periodicals and catalogue.
5	Davidson, H	New York City	Engravings.
1	De Haas, M. F. H	do	Oil-painting.
1	Denham, H	do	Do.
8	De Pauw University	Greencastle, Ind	Catalogues.
16	Department of Agriculture	Washington, D. C	Mammals and birds of economic importance.
31	do	do	Flax fiber.
27	Dopp, H. W., & Son	Buffalo, N. Y	Steam-jacketed kettles.
72	Douglas Sugar Co	Douglas, Kan	Sorghum sugar and sirups.
28	Doussan French Perfumery Co	New Orleans, La	Perfumery.
1	Don, Arthur W	New York City	Oil-painting.
2	Drake, W. H	do	Painting.
7	Dummer Academy	South Byfield, Mass	Pamphlets and catalogues.
7	East Florida Seminary	Gainesville, Fla	Free-hand drawing.
56	Eaton, J. H	Monroe, Wis	Plaiting machine.
73	Edge Hill Wine Co	St. Helena, Cal	Wine.
50	Enterprise Manufacturing Co	Columbiana, Ohio	Feed cutters.
72	Erie Canning Co	Buffalo, N. Y	Canned fruit and vegetables.
18	Evanhoe, F. N	New York	Design in silk.
73	Ewer & Atkinson	Rutherford, Cal	Wines.
42	Fairweather & Ladon	New York City	Hemlock bark.
61	Fisher, Clark	Trenton, Utah	Rail-joint.
8	Fischel, Adler & Schwartz	New York City	Etchings and advertisements.
44	Florida Collective Exhibit	Sanford, Fla	Tobacco.
73	Florida Wine Co	Clay Springs, Fla	Wines.
6	Foote, A. E	Philadelphia, Pa	Geological reports.
16	do	do	Geological map and reports.
31	Fradley, J. F., & Co	New York City	Gold heads for canes.
27	Frank, F. A	do	Cook stoves.
41	do	do	Hardware
51	do	do	Machine for pomades, extracts, etc.
6	French School, House of Refuge	Hudson, N. Y	Scholars' work, etc.
44	Fremery, Felix	Yorktown, Tex	Jute and ramie.
9	Gaillson and Hobron Co	New York City	Books.
73	Gast Wine Co	St Louis, Mo	Wines.
2	Greatorex, Miss Kathleen	Paris	Painting.
1	Gross, P. A	do	Oil painting.
73	Grossman, H	Napa, Cal	Wines.
44	Hamlin, A. C	Bangor, Me	Minerals.
11	Harris, Nathaniel P	Philadelphia, Pa	Furniture designs.
8	Harvard Annex	Cambridge, Mass	Publications and catalogues.
6	Harwood Manufacturing Co	Boston	School chairs.
28	Hartrick, Edwd	San Francisco, Cal	Perfumes
1	Hayden, C. H	Paris	Oil-painting.

List of awards—Honorable mention.

Class.	Exhibitor.	Address.	Exhibit.
9	Heath, D. C., & Co	Boston, Mass	Books.
1	Henry, E. L	New York City	Oil-painting.
3	Held, Chas	Paris	Engraving on metals.
37	Horton, Angell & Co	Attleborough, Mass	Jewelry.
53	Horton & Sons Co	Windsor Locks, Conn	Lathe chucks.
70, 71	Hooper, Geo. F	Sonoma, Cal	Pickled walnuts and olives.
40	Howard, A. H	Boston, Mass	Gymnastic appliances.
16	Hydrographic Office	Washington, D. C	Charts.
61	Inloes, W. H	Asheville, N. C	Railway turn-table lock.
6	Institute of Our Lady of the Sacred Heart.	Washington, D. C	Students' work.
41	International Specialty Co	Buffalo, N. Y	Twine holder.
44	Jackson, A. C	Sanford, Fla	Hay and grasses.
41	Jewett, J. C., Manufacturing Co	Buffalo, N. Y	Refrigerators.
45	Johnston, Henry M	Brooklyn, N. Y	Distemper paints.
20	Kaheun, A., & Co	St. Louis, Mo	Clocks.
37	Kent & Stanley	Providence, R. I	Watch chains.
8	Kentucky University	Lexington, Ky	Reports and catalogues.
70, 71	Kennon, Gray & Co	Sublet Farm, Pa	Canned vegetables.
70, 71	Kimball, Frank A	National City, Cal	Citrus fruits.
9	Knox, Thomas W	New York City	Books.
1	Koehler, Robt	Munich	Oil-painting.
5	Kruell, G	New York City	Engraving.
73	Krugg, Chas	St. Helena, Cal	Wines.
18	Knitted Mattress Co	Canton, Mass	Mattresses.
8	Lafayette College	Easton, Pa	Reports, catalogues, etc.
41	Lawrence, R., & Co	Buffalo, N. Y	Bouquet holders.
28	Leesburgh Manufacturing Co	Leesburgh, Fla	Perfumes.
10	Little, A. P	New York City	Type-writer ribbons.
12	Lloyd, J. H	Troy, N. Y	Photographs.
45	Lugam, C	New Orleans, La	Optical instruments, etc., glasses.
72	Lutted, James	Buffalo, N. Y	Candies.
41	Magnolia Anti-Friction Metal Co	New York City	Metals.

List of awards– Honorable mention.

Class.	Exhibitor.	Address.	Exhibit.
8	Norman Williams Public Library.	Woodstock, Vt	Catalogue.
73	Nouveau Clos Vougeot Vineyard	St. Helena, Cal	Wines.
35	Noyes, J. P	Binghamton, N. Y	Buttons.
41	Nutrizio, Henry	New York City	Coffee-pots.
8	Omaha Public Library	Omaha, Neb	Catalogues.
6	Oregon School for Deaf Mutes	Salem, Oregon	Reports and scholars' work.
70–71	Orestott, Henry	Placer City, Cal	Raisins.
43	Osgood, N. R	Battle Creek, Mich	Portable canvas boat.
1	Parton, Arthur	New York City	Oil-painting.
24	Parker, M. E	Boston, Mass	Fish-scale jewelry.
73	Pearson, Alex. M	Vineland, N. J	Wine.
2	Pennell, Jos	London, England	Painting.
10	Philadelphia Novelty Co	Philadelphia, Pa	Articles for writing tables.
27	....do	....do	Gas burners and fixtures.
41	....do	do	Specialties in cutlery.
49	Piano Manufacturing Co	Chicago, Ill	Binders and mowers.
70, 71	Plant System	Florida	Preserved fruits.
1	Plumb, Henry G	New York City	Oil-painting.
37	Poest, Wm. (Tiffany & Co.)	....do	Collaborator.
9	Poor, H. V. & H. W	....do	Books.
6	Public Schools of Fort Worth	Fort Worth, Tex	Reports, text-books, etc.
6	Public Schools of Lewiston, Me	Lewiston, Me	Do.
61	Railway News Co	New York City	Railroad appliances and models.
6	Rand, McNally & Co	Chicago, Ill	Books.
27	Reid, Adam	Buffalo, N. Y	Portable oven.
41	Reid, A. H	Philadelphia, Pa	Lightning braces.
37	Rider, S. A., & Co	St. Louis, Mo	Jewelry.
70–71	Rixford, G. P	San Francisco, Cal	Nuts and berries.
10	Rogers Stamp Co	Providence, R. I	Stamp with clock movement.
26	do	...do	Automatic dating-stamp.
72	Ross, Mary E	New York City	Excelsior sauces
3	Ruggles, Miss T. A	Anvers, Seine et Oise	Bronze and plaster studies.
12	Ryder, J. F	Cleveland, Ohio	Photographs.
74	Salmon, D. E	Washington, D. C	Models of creamery, silo, etc.
6	School for Young Ladies	New Orleans, La	Catalogues and scholars' works.
29	Schramm, H. G	Camden, N. J	Pipes.
73	Schram, Jacob	St. Helena, Cal	Wines.
1	Shirlan, Walter	New York City	Oil-painting.
41	Shaler & Hall Quarry Co	Portland, Conn	Brownstone.
27	Shepard, Sydney, & Co	Buffalo, N. Y	Household novelties.
28	Sheffield, Dr. L. T	New York City	Dentifrice.
44	Shelborne, Silas	Richmond, Va	Tobacco.
57	Silver and Deming Manufacturing Co	Salem, Ohio	Carriage-making machinery.
	Smith & Pattison	Chicago, Ill	Burnishing enameler.
12	Standard Target Co	Cleveland, Ohio	Targets.
41 24	Straker, Wm Gorham Manufacturing Co	New York City	Collaborator.
8	St Louis Public Library	St Louis, Mo	Catalogues.
8	St Stephen's College	Annandale, N. Y	Reports and catalogues.
9	Stokes, Frederic H	New York City	Books.
69	Swift & Co	Chicago, Ill	Lard.
9	Taintor Bros & Co	New York City	Books
1	Therat, Chas	Paris	Oil painting.
61	Thornton & Motley (Railway News Co.)	New York City	Collaborator.

List of awards—Honorable mention.

Class.	Exhibitor.	Address.	Exhibit.
42	Tiffany Chemical Co	New York City	Tan-bark and tan extracts.
56	Tillinghast Supply Co	Providence, R. I	Sewing-machine.
29	Torrey, J. R., & Co	Worcester, Mass	Razor-strops.
53	Tower & Lyon	New York City	Patent vises.
26	Trenton Watch Co	do	Watches.
1	Turner, Chas. Y	do	Oil-painting.
37	Uibel & Barber	do	Alligator teeth and sea-bean jewelry.
53	Upton, Geo	Boston, Mass	Sand-paper.
1	Vedder, Elihu	Rome	Oil-painting.
27	Vizet, V	New Rochester, N. Y	Gas bracket.
45	Ward, Everett	New York City	Soaps.
3	Warner, Olin L	do	Sculpture.
61	Warren, Andrew	St. Louis, Mo	Railroad jacks.
26	Waterbury Watch Co	Waterbury, Conn	Watches.
10	Weeks & Campbell	New York City	Leather and celluloid specialties.
8	Wellesley College	Wellesley, Mass	Reports, catalogues, etc.
92	Wharton, Joseph	Camden, N. C	Metallic alloys.
1	Whiteman, S. E	St. Leger, Seine et Oise	Oil-painting.
53	Whiton Machine Co	New London, Conn	Lathe-chucks, machines, etc.
2	Wiles, Irving R	New York City	Painting.
24	Wilkinson, Walter (Gorham Manufacturing Co.).	do	Collaborator.
63	Wilson, James Godfrey	do	Rolling blinds and shutters.
52	Wilson & Roake	do	Steam-trap and skimmer.
56	Wingate, Julia F	do	System of dress-measuring.
44	Winston, Frank	Tennessee	Tobacco.
8	Woburn Public Library	Woburn, Mass	Catalogue.
5	Wolf, Henry	New York City	Engravings.
12	Wood, G. B	Philadelphia Pa	Photographs.
1	Worthington, Whittredge	New York City	Oil-painting.
1	Wynant, A. H	do	Do.
44	Ybor, Martinez & Co	Ybor City, Fla	Cigars.

APPENDIX O.

DECORATIONS BESTOWED ON ACCOUNT OF THE UNITED STATES AT THE PARIS EXPOSITION, 1889.

LEGION OF HONOR.

General W. B. Franklin.....Grand Officer
Thomas A. Edison.....Commander
Somerville Pinkney Tuck.....Officer
A. Bailly-Blanchard.....Officer
General Rush C. Hawkins.....Officer
General Francis A. Walker.....Officer
Elihu Thomson.....Officer
William C. Gunnell.....Chevalier
Capt. D. A. Lyle, U. S. Army.....Chevalier
Capt. Henry C. Cochrane, U. S. Marine Corps.....Chevalier
David Urquhart, jr.....Chevalier
Charles B. Richards.....Chevalier
C. V. Riley.....Chevalier
B. Abdank-Abakanowicz.....Chevalier
Lieut. Aaron Ward, U. S. Navy.....Chevalier
David Cahn.....Chevalier
Max Hellman.....Chevalier
A. L. Rotch.....Chevalier
W. T. Dannat.....Chevalier
John Lafarge.....Chevalier
Nathaniel Wheeler.....Chevalier
William Sellers.....Chevalier
Leroy W. Fairchild.....Chevalier
W. H. Doane.....Chevalier
Edward C. Moore.....Chevalier
Warren M. Healey.....Chevalier
John S. Sargent.....Chevalier
Alexander Harrison.....Chevalier
Ridgway Knight.....Chevalier

OFFICERS OF PUBLIC INSTRUCTION.

Lieut. B. H. Buckingham, U. S. Navy.
Arthur J. Stace.
Spencer B. Newberry.
W. H. Chandler.
C. Wellman Parks.
Robert H. Thurston.
S. N. Gotendorf.
William T. Harris.
Alexander Harrison.
Charles S. Hastings.
Charles S. Tainter.
Carl Hering.

OFFICERS OF THE ACADEMY.

George J. Lucky.
James McAllister.
George F. Kunz.
Frank van der Stucken.
Cleveland Abbe.
William F. Gardner.

AGRICULTURAL MERIT.

A. Howard Clark.....Officer
David King.....Chevalier
F. T. Bickford.....Chevalier
James Cheeseman.....Chevalier
C. Richards Dodge.....Chevalier

APPENDIX P.

UNIVERSAL INTERNATIONAL EXPOSITION OF 1889.

LIST OF INTERNATIONAL CONGRESSES.

Names of Congresses.	Date and length of session.	Names and addresses of the presidents of committees of organization.
Labor Accident	Sept. 9 to Sept. 14	Mr. Lander, rue du Luxembourg, 38.
Ballooning	July 31 to Aug. 3	Mr. Janssen, Observatory, Meudon, Seine-et-Oise.
Agriculture	July 8 to July 11	Mr. Méline, Palais-Bourbon.
Alcoholism (for the study of questions relating thereto).	July 29 to July 31	Mr. Bergeron, boulevard Haussman, 157.
Anthropology (criminals)	Aug. 10 to Aug. 17	Mr. Brouardel, École de Médecine.
Prehistoric Anthropology and Archæology.	Aug. 19 to Aug. 26	Mr. De Quatrefages, rue Geoffroy St. Hilaire, 36.
Architects	June 17 to June 22	Mr. Bailly, boulevard Bonne-nouvelle, 19.
Relief in time of War (works, Red Cross).		
Public Charity	July 28 to Aug. 4	Dr. Th. Roussel, rue des Mathurins, 64.
Blind (amelioration of their condition).	Aug. 5 to Aug. 8	Mr. Martin, boulevard des Invalides, 56.
Bibliography of the Mathematical Sciences.	July 16 to July 26	Mr. Poincaré, rue Claude-Bernard, 63.
Bakeries	June 28 to July 26	Mr. Cornet, rue Rochechouart, 34.
Chemistry	July 29 to Aug. 3	
Watchmaking	Sept. 7 to Sept. 14	Mr. De Jonquieres, avenue Bugeaud, 2.
Carrier Pigeons	July 31 to Aug. 3	Mr. Janssen, Observatory Meudon, Seine-et-Oise.
Colonial (colonial questions)	Sept. 22 to Sept. 28	Mr. Barbey, rue de Régard, 22.
Dentistry	Sept. 1 to Sept. 7	Dr. David, boulevard St. Germain, 180.
Skin and Syphilitic Diseases	Aug. 5 to Aug. 10	Dr. Hardy, boulevard Malsherbes, 5
Commerce and Industry	Sept. 22 to Sept. 28	Mr. Poirrier, rue Lafayette, 105,
Electricians	Aug. 24 to Aug. 31	Mr. Mascart, rue de l'Université, 176.
Primary Instruction	Aug. 11 to Aug. 19	Mr. Gréard, à la Sorbonne.
Higher Instruction	Aug. 5 to Aug. 10	Do.
Technical, Commercial, and Industrial Instruction.	July 8 to July 12	Do.
Ethnography (The Sciences)		Mr. Oppert, rue de Sfax, 2.
Athletic Exercises in Education	June 15	Mr. Jules Simon, place de la Madeleine, 10.
Women's Work and Institution	July 12 to July 18	
Geography (The Sciences)	Aug. 6 to Aug. 12	Mr. De Bizemont, boulevard St. Germain.
Cheap Dwellings	June 26 to June 28	Mr. Siegfried, rond point des Champs Elysées, 6.
Homeopathy	Aug. 21 to Aug. 23	Dr Léon Simon, rue de la Tour des Dames, 5.
Horticulture	Aug. 19 to Aug. 21	Mr Hardy, rue du Potager 4, à Versailles
Hydrology and Climatology	Oct. 3 to Oct. 10	Mr Remon, Observatory, Parc St. Maur (Seine).
Hygiene of Demography	Aug. 4 to Aug. 11	Mr. Brouardel, École de Médecine
Intervention of the State in Contracts of Labor	July 1 to July 4	Mr. Donnat, rue Chardin, 11.

List of International Congresses.

Names of Congresses.	Date and length of session.	Names and addresses of the presidents of committees of organization.
Intervention of the State in Immigration and Emigration.	.....	Mr. Isaac, rue Ste. Beuve, 7.
Intervention of the State in Price of Provisions.	July 5 to July 10	Mr. Frédéric Passy, rue Labordère, 8, à Neuilly.
Applied Mechanics	Sept. 16 to Sept. 21	Mr. Philips, rue de Marignon, 17.
Medical Jurisprudence	Aug. 19 to Aug. 24	Dr. Brouardel, École de Médecine.
Insanity	Aug. 5 to Aug. 10	Dr. Falret, rue du Bac, 114.
Veterinary Surgeons	Sept. 19 to Sept. 24	Mr. Chauveau, rue Jules-Janin, 10.
Meteorology	Sept. 19 to Sept. 25	Mr. Renou, Observatory, St. Maur (Seine).
Mines and Metallurgy	Sept. 2 to Sept. 11	Mr. Castel, boulevard Raspail, 144.
Money	Sept. 11 to Sept. 14	Mr. Magnin, à la Banque.
Officers and Non-Commissioned Officers of the Fire Brigade.	Aug. 27 to Aug. 28	Mr. Wolff, avenue Bosquet, 18.
Otology and Larynxology	Sept. 16 to Sept. 21	Dr. Duplay, rue de Penthièvre, 2.
Peace	June 23 to June 30	Mr. Frédéric Passy, rue Labordère, 8, Neuilly.
Share of Profits	July 16 to July 29	Mr. Charles Robert, rue de la Banque, 15.
Photography	Aug. 6 to Aug. 17	Mr. Janssen, Observatoire de Meudon, Seine-et-Oise.
Celestial Photography		
Provident Institutions	July 15 to July 20	
Processes of Construction	Sept. 9 to Sept. 14	Mr. Eiffel, rue Prony, 60.
Artistic Property	July 25 to July 31	Mr. Meissonier, boulevard Malsherbes, 131.
Real Estate (for the study of its transfer).	Aug. 8 to Aug. 14	Mr. Duverger, à l'École de Droit.
Property in Patents	Aug. 3 to Aug. 14	Mr. Teisserenc de Bort, ave. Marceau, 82.
Popular Traditions	July 29 to Aug. 1	Mr. Ploix, Quai Malaquai.
Protection of Works of Art and Monuments.	June 24 to June 29	Mr. Chas. Garnier, boulevard St. Germain, 60.
Physiological Psychology	Aug. 5 to Aug. 10	Dr. Charcot, boulevard St. Germain, 117.
Weekly Rest	.....	Mr. Léon Say, rue Fresnel, 21.
Life-Saving	June 12 to June 15	Mr. Lisbonne, rue St. Vincent de Paul, 3.

APPENDIX Q.

AMERICAN DELEGATES TO THE INTERNATIONAL CONGRESSES APPOINTED BY THE COMMISSIONER-GENERAL.

Prof. Thomas Wilson, Smithsonian Institution, Washington, D. C.: Hygiene and Demography, Criminal Anthropology, Prehistoric Anthropology and Archæology.

C. T. Mason: Prehistoric Anthropology and Archæology.

Dr. Thomas W. Evans, Paris: Public Assistance in Time of War.

Prof. S. B. Newberry, Cornell University, Ithaca, N. Y.: Chemistry, Photography.

Dr. W. H. Chandler, Lehigh University, South Bethlehem, Pa.: Chemistry, Technical Instruction.

W. A. Donaldson, Boston, Mass.: Primary Instruction.

Prof. C. Wellman Parks, Rensselaer Polytechnic Institute, Troy, N. Y.: Popular Traditions, Primary Instruction, Secondary and Higher Education, Applied Mechanics.

Prof. H. W. Howe, Boston, Mass.: Technical Instruction, Mines and Metallurgy.

Prof. A. Howard Clark, Boston, Mass.: Geographical Science.

Prof. C. V. Riley, Department of Agriculture, Washington, D. C.: Zoology, Horticulture, Physiological Psychology.

Prof. David King, Newport, R. I.: Horticulture.

A. L. Rotch, Readville, Mass.: Hydrology and Climatology, Meteorology.

Dr. John H. Rauch, Chicago, Ill.: Intervention of Law in Contracts of Labor.

Anthony Pollock, Washington, D. C.: Industrial Property.

Capt. D. A. Lyle, U. S. Army, Ordnance Department: Life-Saving Service.

A. G. Wilkinson, Washington, D. C.: Industrial Property.

In addition to the above appointments the United States Commissioner-General and the Assistant Commissioner-General were members by invitation of the presidents of the following international congresses, respectively:

The United States Commissioner-General: Commerce and Industry. Cheap Dwellings. Life Saving. Public Assistance. Savings Banks. Emigration and Immigration.

The Assistant Commissioner-General: Protection to Artistic Property. Savings Institutions. Profit Sharing. Commerce and Industry. Peace.

APPENDIX R.

DONATIONS OF EXHIBITS BY UNITED STATES EXHIBITORS.

PARIS EXPOSITION, 1889.

The following exhibits were given to the Société de Géographie, Paris:
Prof. Henry S. Osborn, Oxford, Ohio.
Frederick Cope Whitehouse, New York City.
Chief Engineer, U. S. Army.

The following exhibits were given to M. Émile Turquem, Paris:
College of Physicians, Philadelphia, Pa.
Eclectic Medical College of Cincinnati, Ohio.
Homeopathic Medical College, Chicago, Ill.
Indiana State Medical Society, Indianapolis, Ind.
Medical Society of Kings County, Brooklyn, N. Y.
New York Academy of Medicine, New York City.

The following exhibits and parts were given to the Musée Pédagogique, Paris:
Brooklyn Library Association.
Hyatt School Slate Company, Limited, Bethlehem, Pa.
Indian Industrial School, Carlisle, Pa.
J. B. Lippincott & Co., Philadelphia, Pa.
Kansas State Agricultural College, Manhattan, Kan.
Maryland State Normal School, Baltimore, Md.
New England Publishing Company, Boston, Mass.
Philadelphia Manual Training School, Philadelphia, Pa.

Exhibits and parts given to the Pedagogic Museum, Albany, N. Y.—*Continued.*

Public Schools of Sandusky, Ohio.
Rowland Hall School, Salt Lake City, Utah.
St. Louis Manual Training School, St. Louis, Mo.
St. Stanislaus Commercial College, Bay St. Louis, Miss.
School Department, House of Refuge, Randall's Island, New York.
State Department of Public Instruction, Austin, Tex.

The following exhibits were given to the National College of Medicine, Paris:

Massachusetts College of Pharmacy, Boston, Mass.
Philadelphia College of Pharmacy, Philadelphia, Pa.

The following exhibits were given to the Conservatoire des Arts et Metiers, Paris.

Benjamin J. Dashiel, jr., Baltimore, Md.
Herman Hollerith, Washington, D. C.

The following exhibits were given to the Commercial and Industrial Museum of France, Paris:

School desks from Boston School Exhibit.
Seats and chairs from Harwood & Co., Boston, Mass.
Slates and crayons from D. C. Pratt & Co., New York.

The following exhibits were given to the Association of National History, Paris:

New Haven Historical Society, New Haven, Conn.
Southern Historical Society, Richmond, Va.
Virginia Historical Society, Richmond, Va.

The exhibit of the American Antiquarian Society of Worcester, Mass., was given to the American Society of France.

That of James Hall, LL.D., was given to the Société d'Histoire Naturelle.

That of J. H. Ryder to C. H. Gravier, lecturer in the College of France.

That of the University of California to the Paris Observatory.

That of the Rensselaer Polytechnic Institute to l'École Centrale, Paris.

That of the State Public Schools of Michigan, Coldwater, Mich., to the Société Générale des Prisons, Paris.

That of the Massachusetts Institute of Technology to the Imperial and Royal Polytechnic School of Austria, Lemberg, Austria.

The following exhibits and parts were given to the National Library, Paris:

American Baptist Missionary Union, Boston, Mass.
American Institute of Electrical Engineers, New York.
American Museum of Natural History, New York.
Board of Education of Wisconsin, Madison, Wis.
Baltimore Public Schools, Baltimore, Md.
Bangor Library, Bangor, Me.
Bureau of Education, Washington, D. C.
Chicago Public Library, Chicago, Ill.
Colorado Institution for the Deaf and Blind, Colorado Springs, Col.
Dayton Public Library, Dayton, Ohio.
Department of Public Instruction of Iowa, Des Moines, Iowa.
Department of Public Instruction of Arkansas, Little Rock, Ark.
Department of Public Instruction of California, Sacramento, Cal.
Dartmouth College, Hanover, N. H.
General Society of Mechanics and Tradesmen of the city of New York.
Federal Government Reports—
Department of Agriculture.
Department of State.
Interior Department.
Navy Department.
Treasury Department.
War Department.

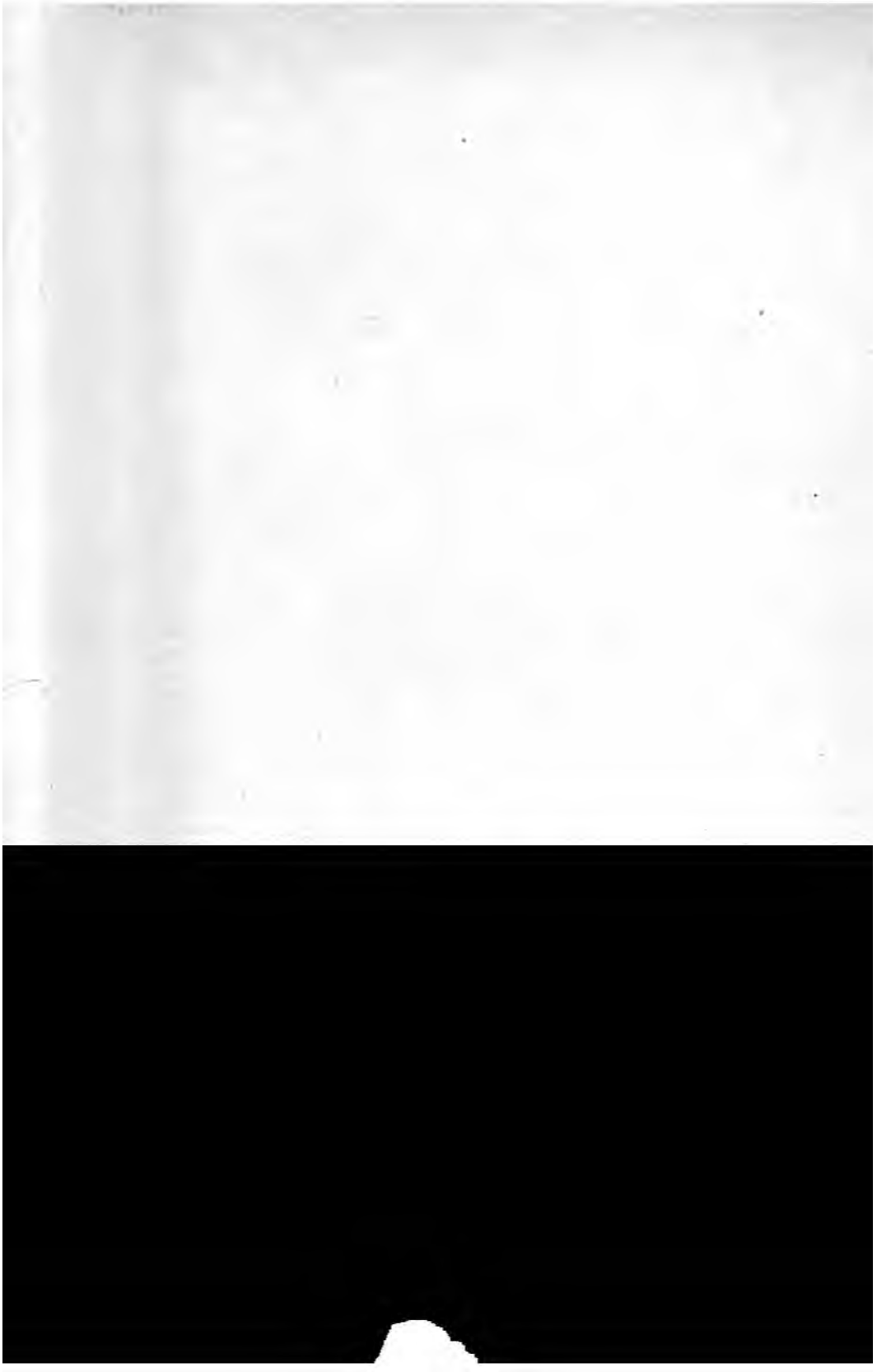
Exhibits and parts given to the National Library, Paris—*Continued.*

H. V. and H. W. Poor, New York City.
Hiwassee College, Hiwassee, Tenn.
Horace B. Miller, New York City.
Indiana University, Bloomington, Ind.
Insurance Department of Connecticut, Hartford, Conn.
Insurance Department of Indiana, Indianapolis, Ind.
Insurance Department of Kansas, Topeka, Kans.
Insurance Department of Michigan, Lansing, Mich.
Insurance Department of Nebraska, Lincoln, Neb.
Insurance Department of New Jersey, Trenton, N. J.
Insurance Department of Pennsylvania, Harrisburg, Pa.
Insurance Department of Wisconsin, Madison, Wis.
Lafayette College, Easton, Pa.
Massachusetts Institute of Technology, Boston, Mass.
Massachusetts Insurance Commission, Boston, Mass.
Minnesota School for the Deaf, Faribault, Minn.
New York Mercantile Library Association, New York City.
Norman Williams Library, Woodstock, Vt.
Ohio Institution for Feeble-Minded Children, Columbus, Ohio.
Public Library, Fitchburg, Mass.
Public Library, Toledo, Ohio.
Railroad Commission of Iowa, Des Moines, Iowa.
Railroad Commissioner of Connecticut, Hartford, Conn.
Railroad Commissioners of Alabama, Montgomery, Ala.
Railroad Commissioners of Virginia, Richmond, Va.
Railroad Commissioners of Wisconsin, Madison, Wis.
Railway Commission of Ohio, Columbus, Ohio.
St. Stephen's College, Annandale, N. Y.
Secretary of Internal Affairs, Harrisburg, Pa.
State Board of Health, Lansing, Mich.
State Board of Registration, Lansing, Mich.
State Department of Education, Harrisburg, Pa.
State Industrial University of Illinois, Urbana, Ill.

APPENDIX S.

The expenditures have been classified as follows:

Services of Commissioner-General	$10,000.00
Services of Assistant Commissioner-General	5,000.00
Services of nine scientific experts	13,500.00
Clerks to experts	11,016.93
Engineers, superintendents of sections, and skilled labor	17,597.90
Jurors	7,200.00
Watchmen and guardians	7,008.44
Clerk hire in New York, Paris, and Hartford	18,295.31
Expenses of New York and Hartford offices	2,475.72
Expenses of Paris office	7,633.95
Postage, expressage, and telegrams	1,925.24
Stationery and printing	4,806.05
Advertising	1,349.95
Outward freight and terminal expenses	32,146.51
Inward freight and terminal expenses	16,005.44
United States Government exhibits	5,413.69
Fine arts section	3,420.31
Educational section	2,665.44
Industrial section	16,923.89
Machinery section	9,526.91
Agricultural section	35,969.69
Preparation of report	12,646.10
Miscellaneous expenditures	7,472.53
Total	250,000.00



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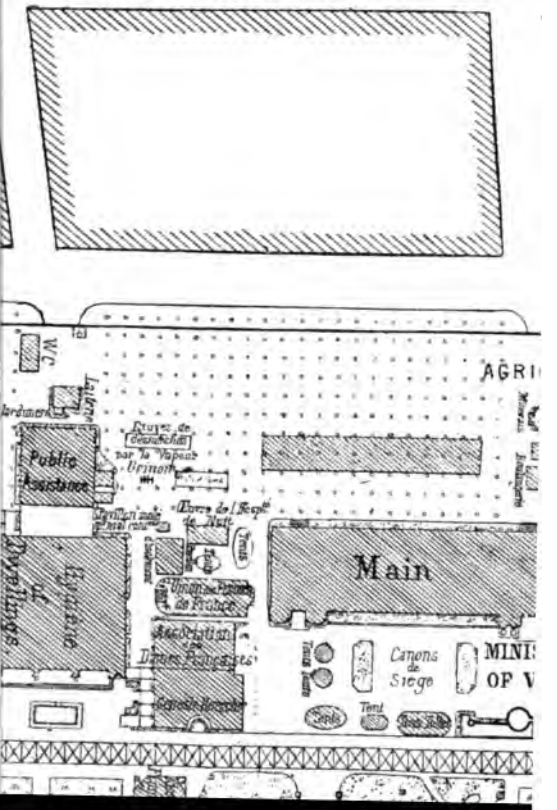

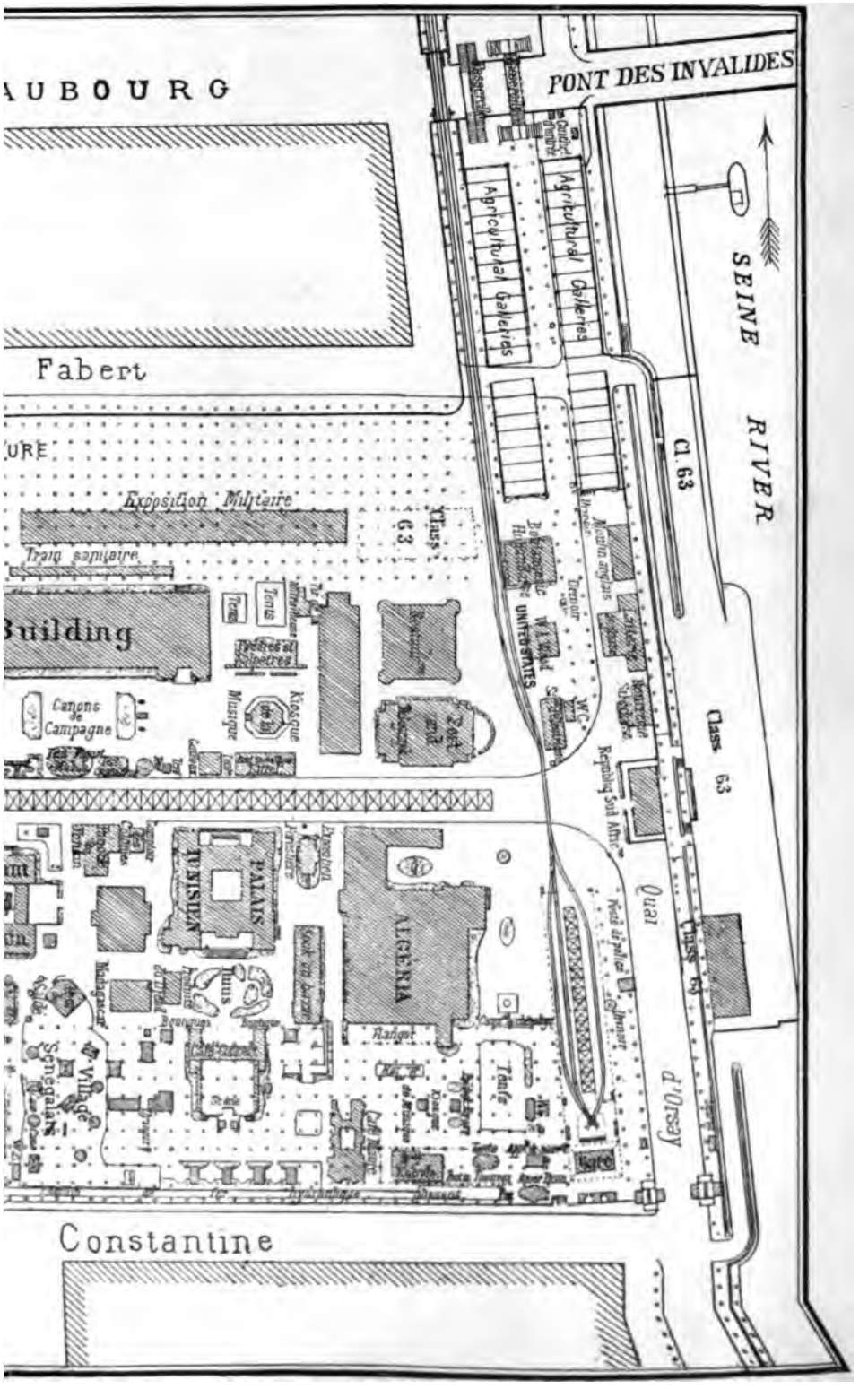
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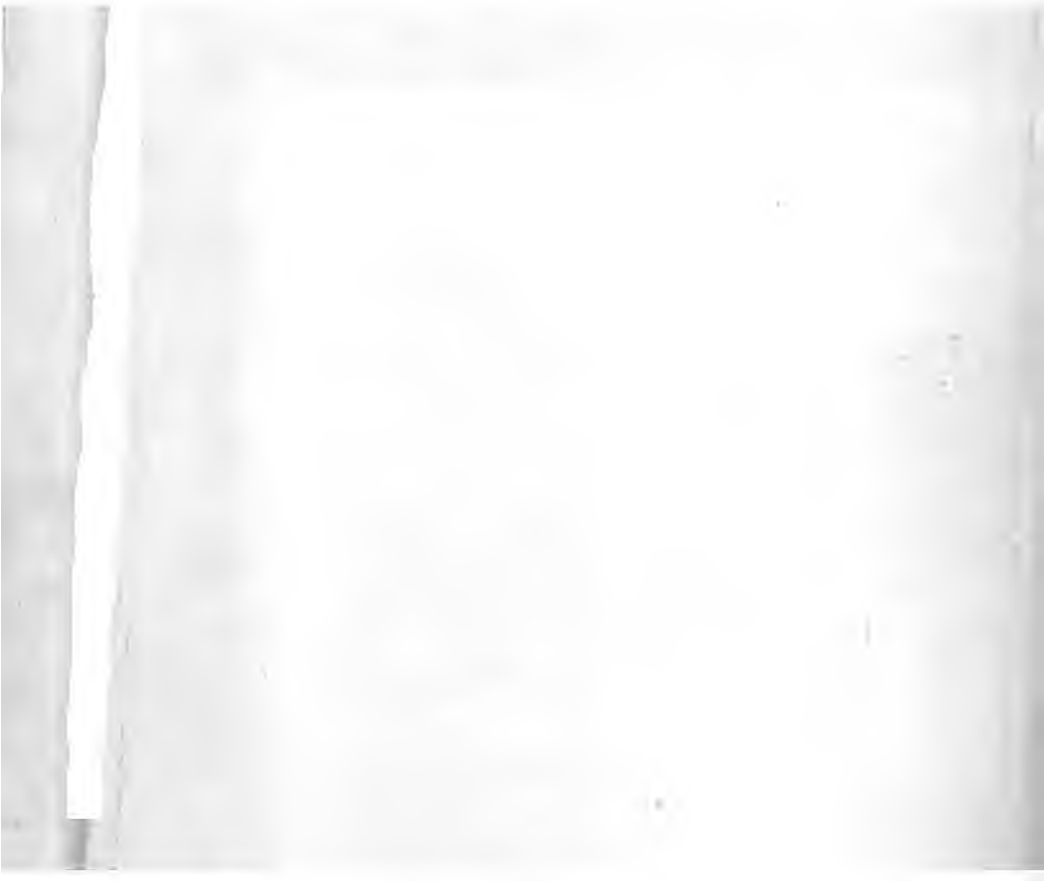
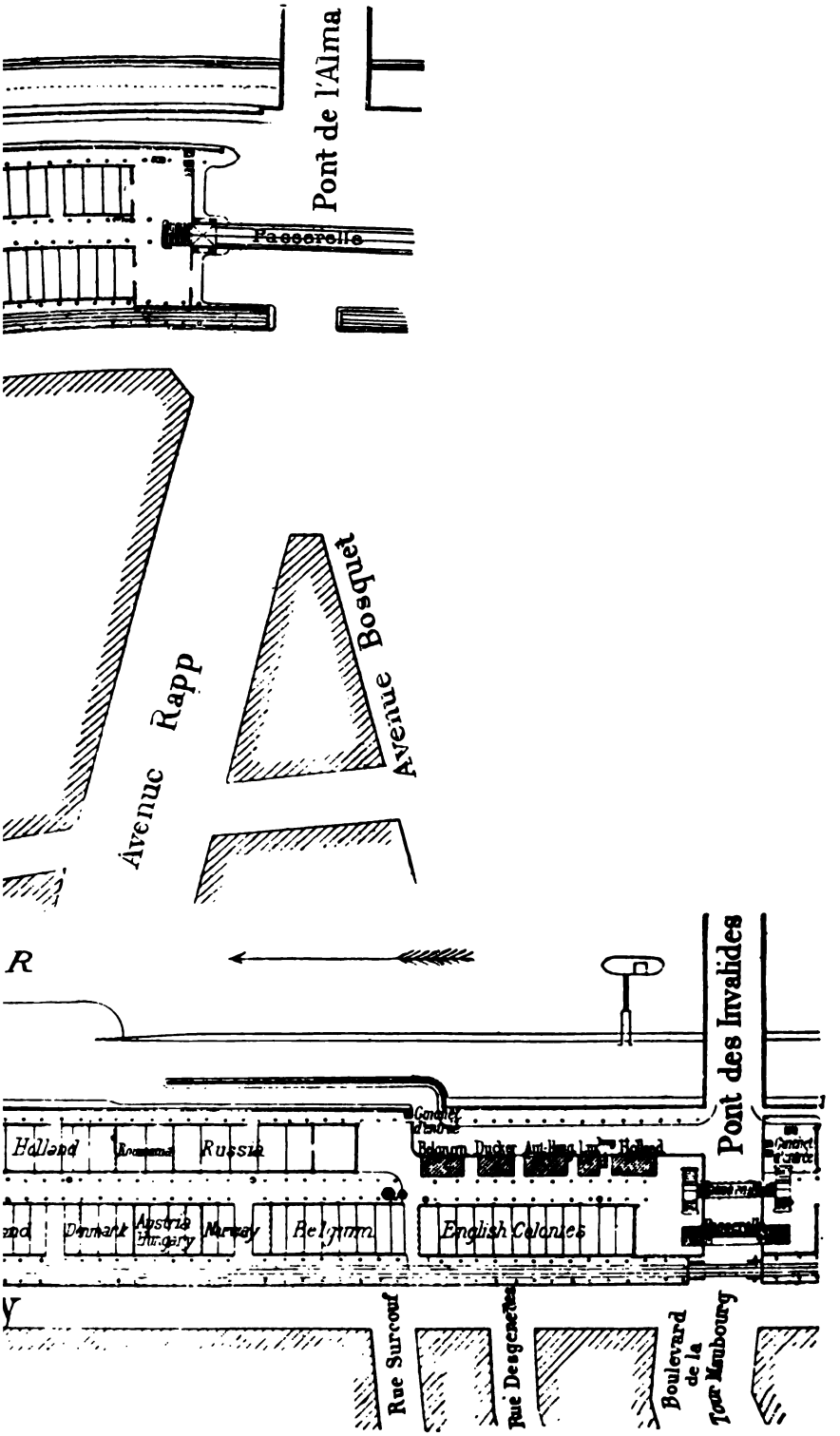
SEINE RIVER
Cl. 63
Class 63
Agricultural Galleries
Fabert
Exposition Militaire
Train sanitaire
Building
Tents
Cannons de Campagne
Kiosque Musique
UNITED STATES
W.C.
Republiq. Sud Afric.
Quai d'Orsay
TUNISIAN PALACE
ALGERIA
Tunis
Madagascar
Senegalese Village
Constantine




Pont de l'Alma
Passerelle
Avenue Rapp
Avenue Bosquet
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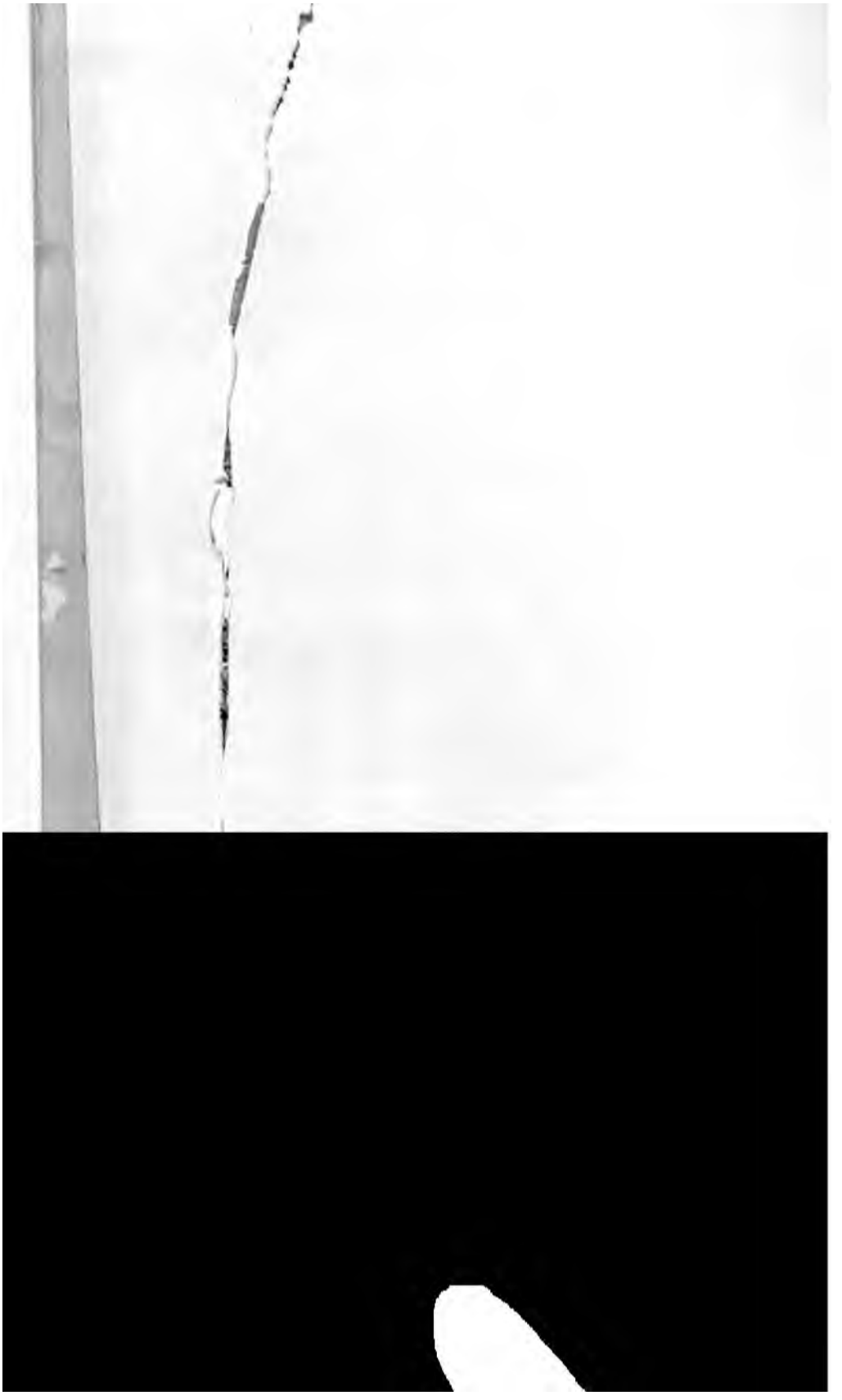
Pont des Invalides
Holland
Russia
Belgium
Denmark
Austria Hungary
Norway
Belgium
English Colonies
Rue Surcouf
Rue Desgenettes
Boulevard de la Tour Maubourg

Cl. 60
Hungary
Austria
Cl. 30
Jewelry
Cl. 32
Cl. 24
Cl. 20
23
Ceramics
Glass
Japan



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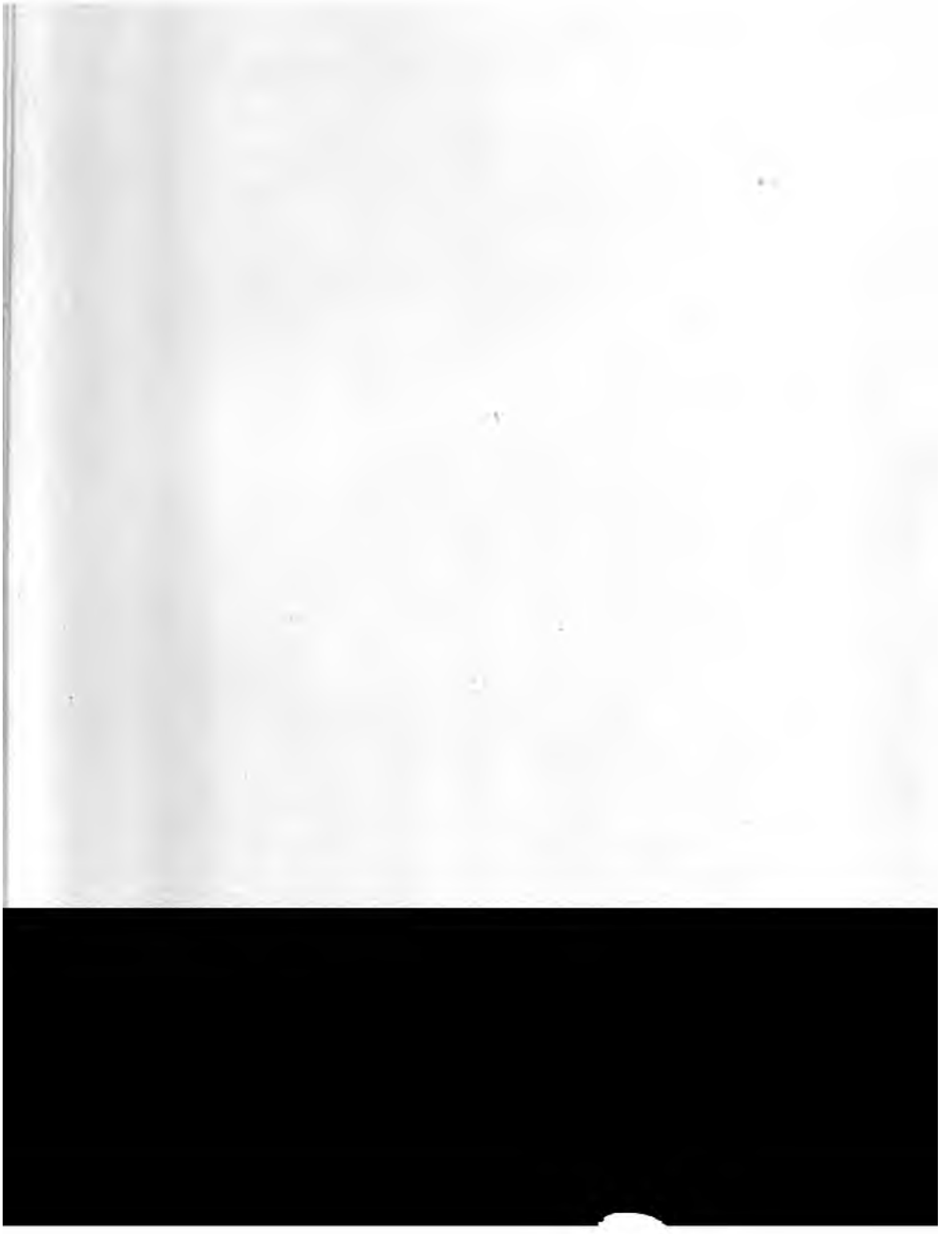

PARIS EXPOSITION.

GENERAL INDEX.

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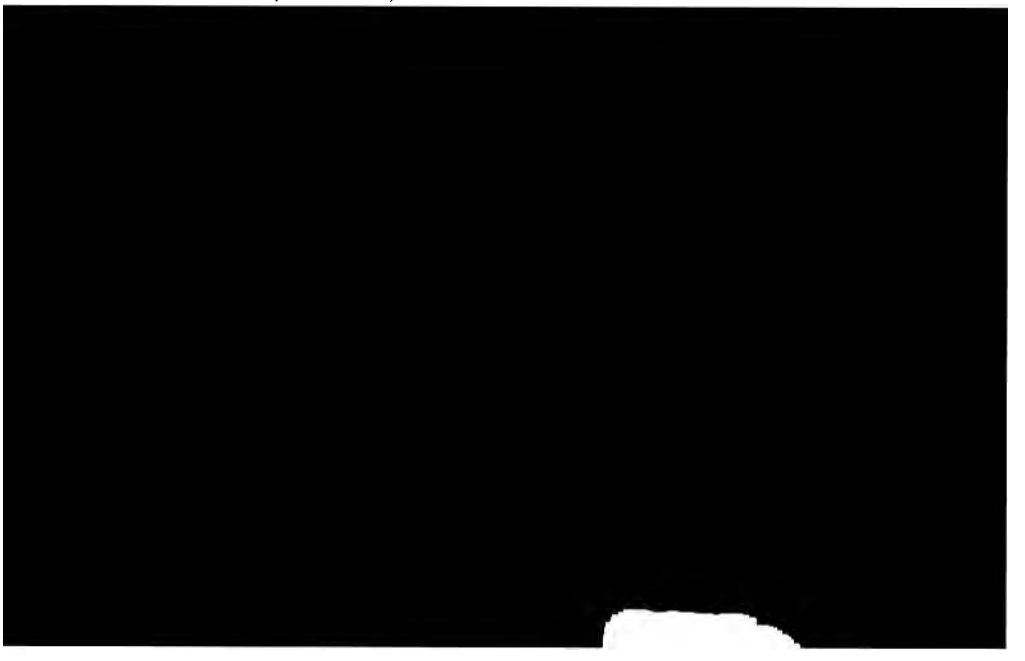

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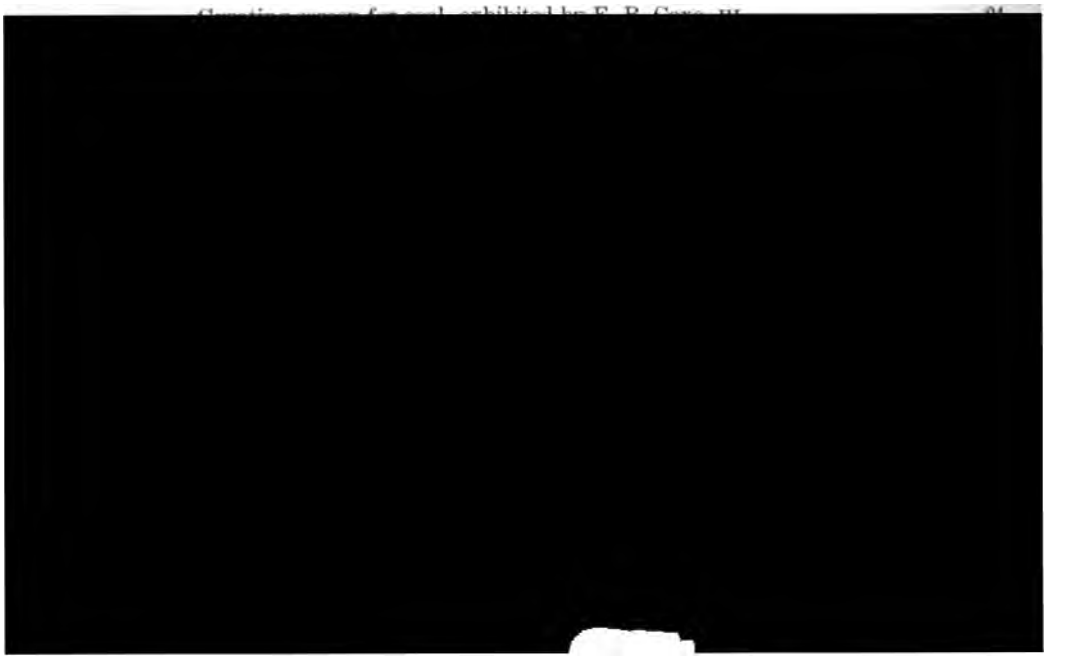

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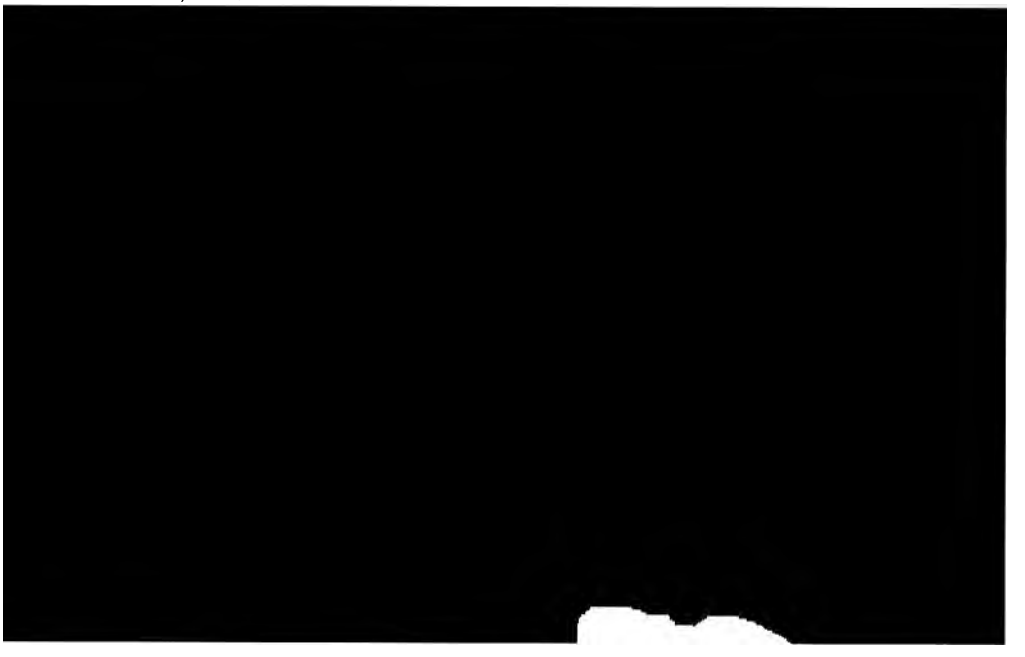

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English.—London, Brighton and South Coast Railway Company, Southeastern Railway Company, North London Railway Company, London and Northwestern Railway Company, Midland Railway Company.

Swiss.—Société Suisse of Winterthur.

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Engravers: Aikman (Miss), Bernstrom, Closson, Cole, Davidson, Davis, French, Johnson, King, Kingsley, Kruell, Lindsay, Miller, Caroline A. Powell, Putnam, Smithweck, Standenbour, Tinkey, Varley, Wellington, and Wolff.
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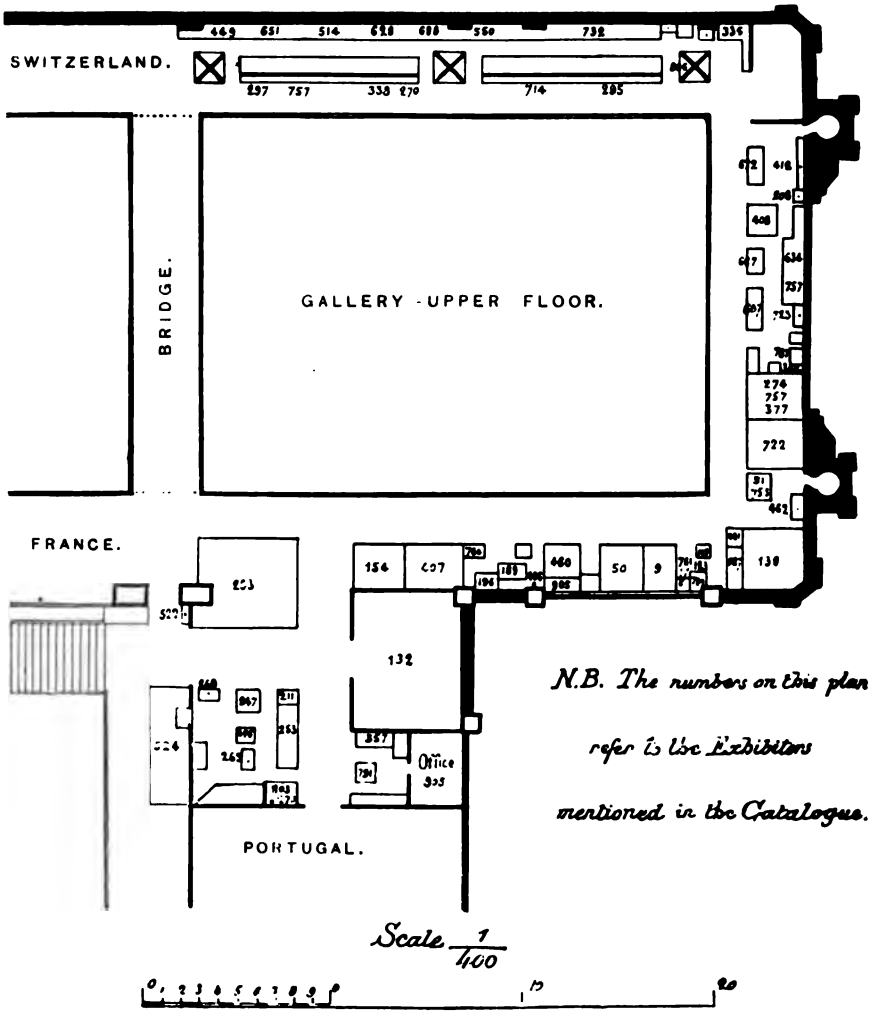
[UPPER FLOOR.]

UNITED STATES SECTION.



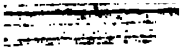
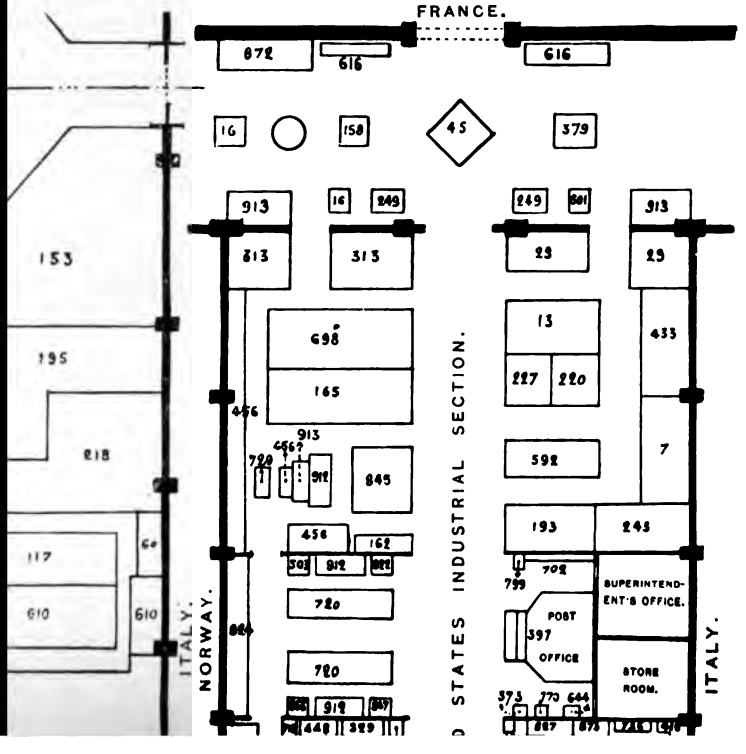
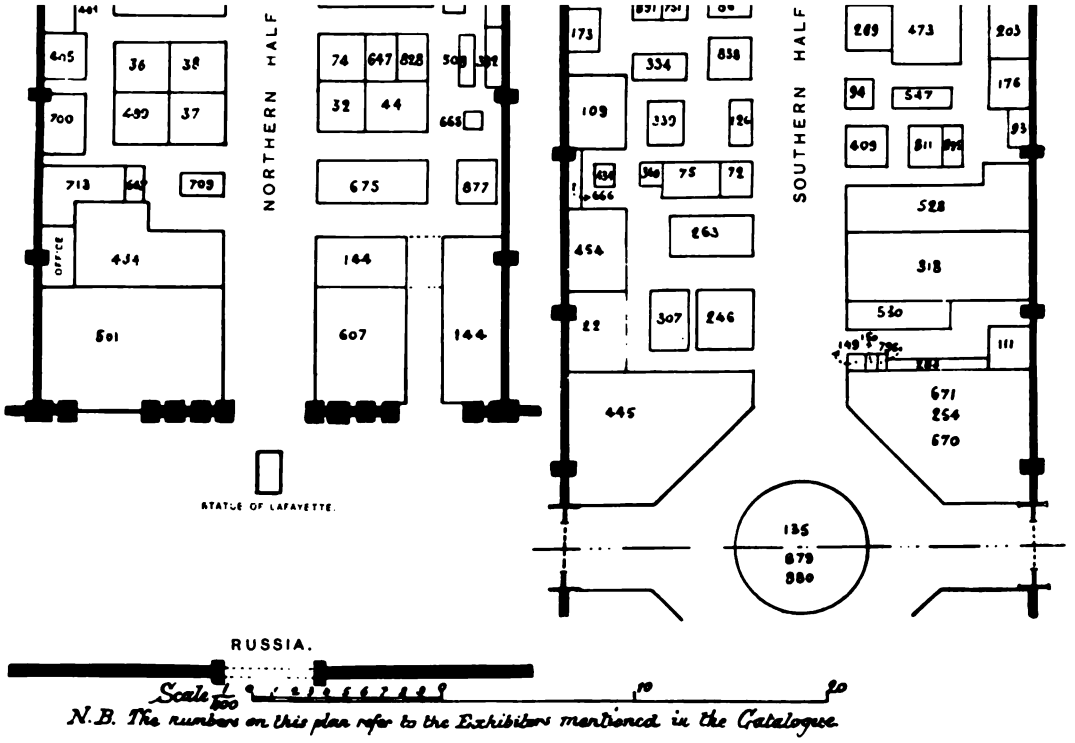


PLATE III.

U. S. INDUSTRIAL SECTION.





N.B. The numbers on this plan refer to the Exhibitors mentioned in the Catalogue.

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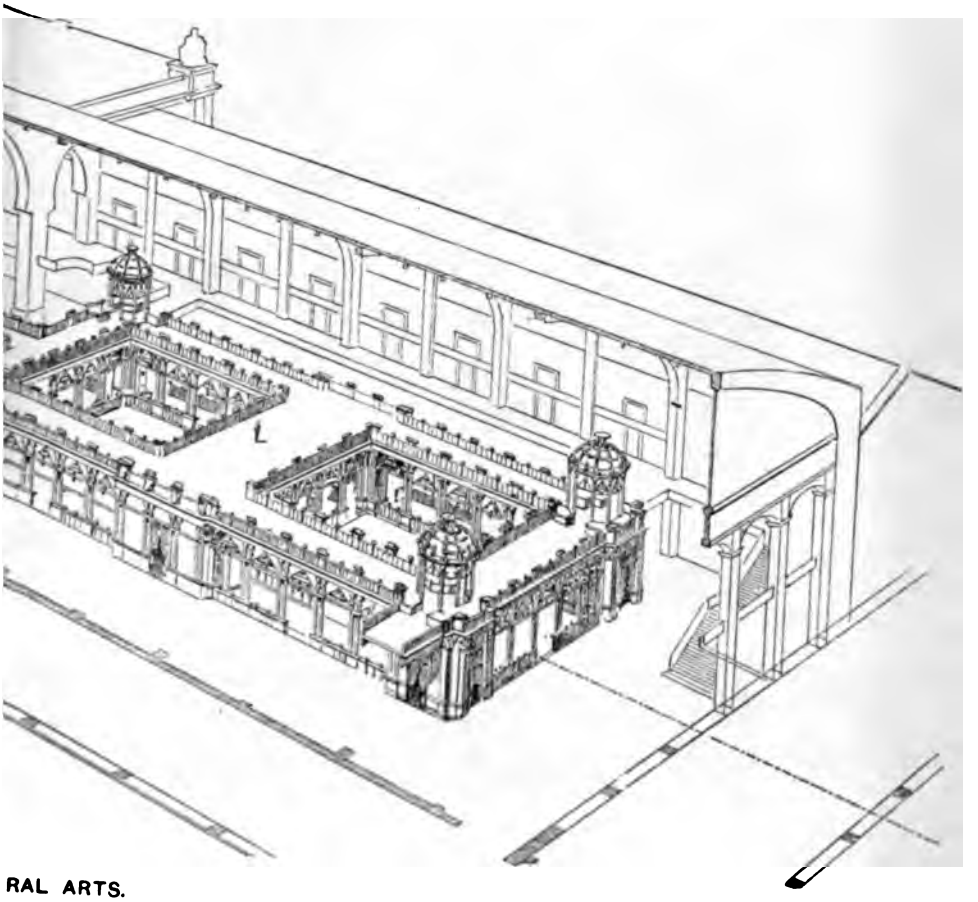
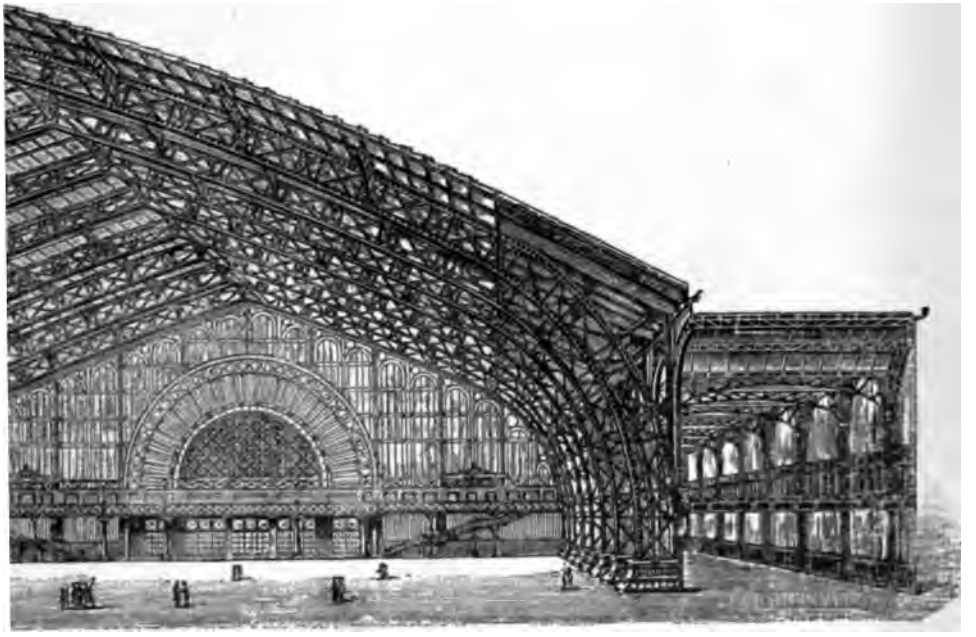


RAL ARTS.

PLATE X.



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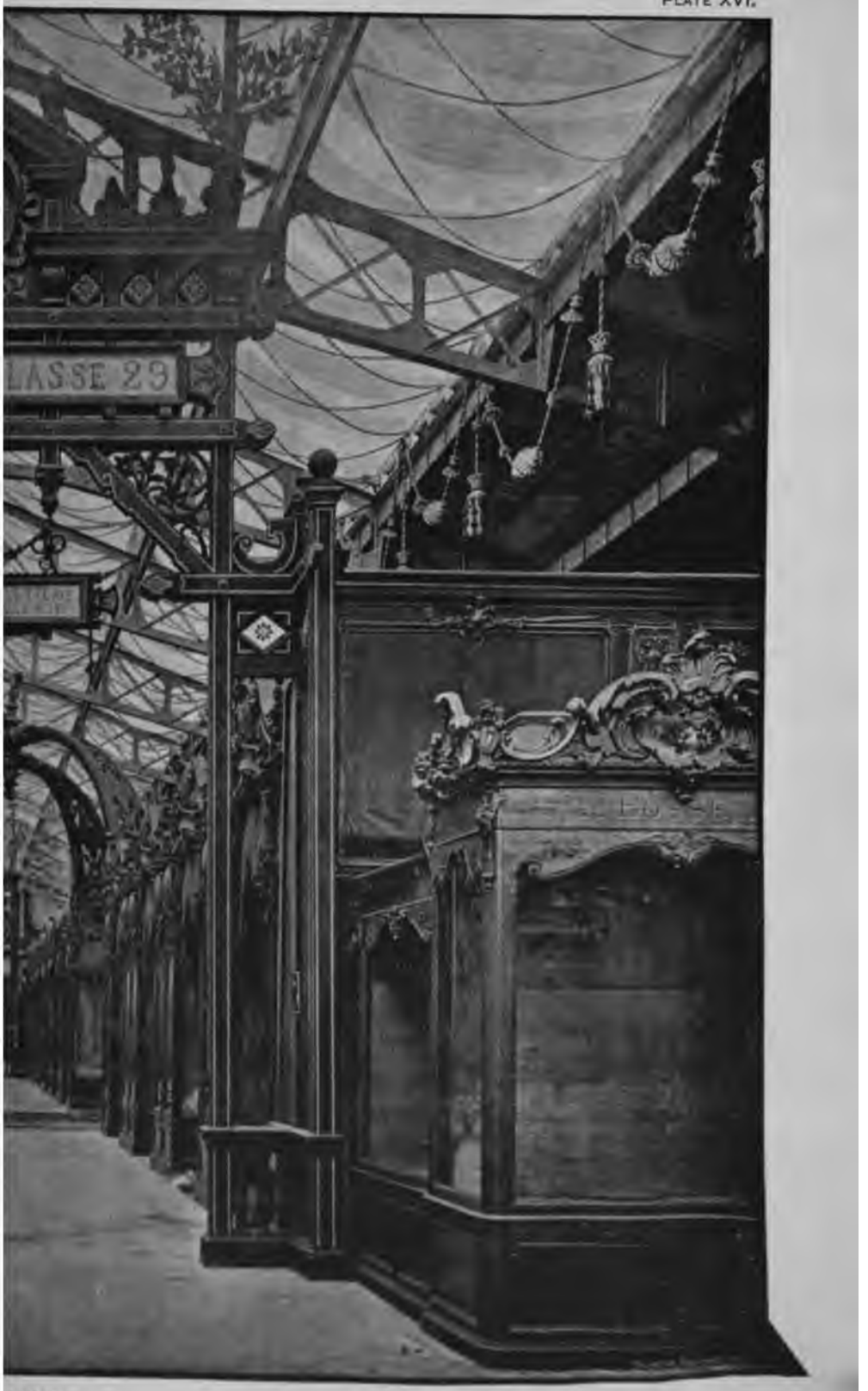
VIEW FROM END OF UNITED STATES INDUSTRIAL SECTION.

HINERY SECTION.

GRO



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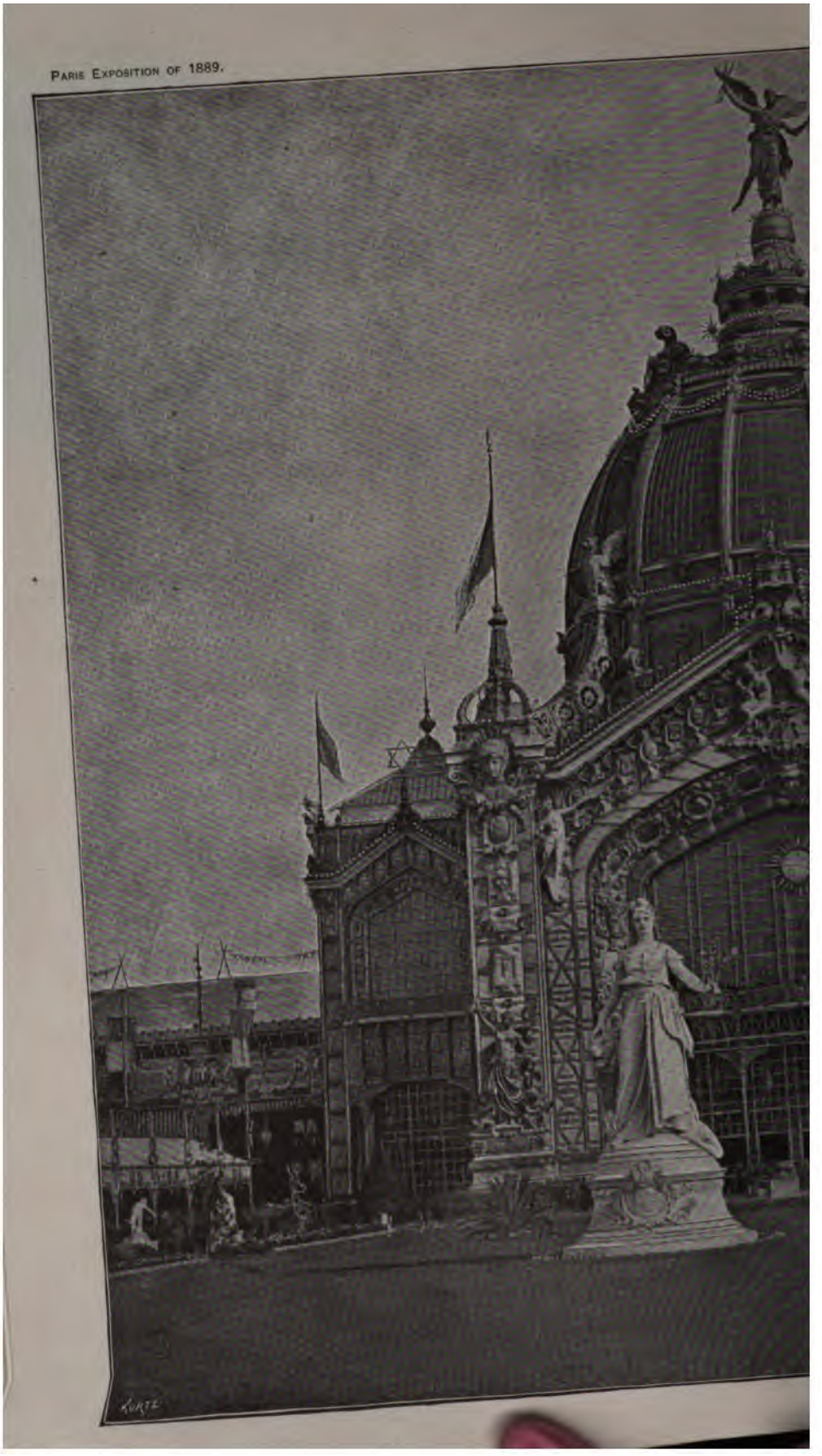
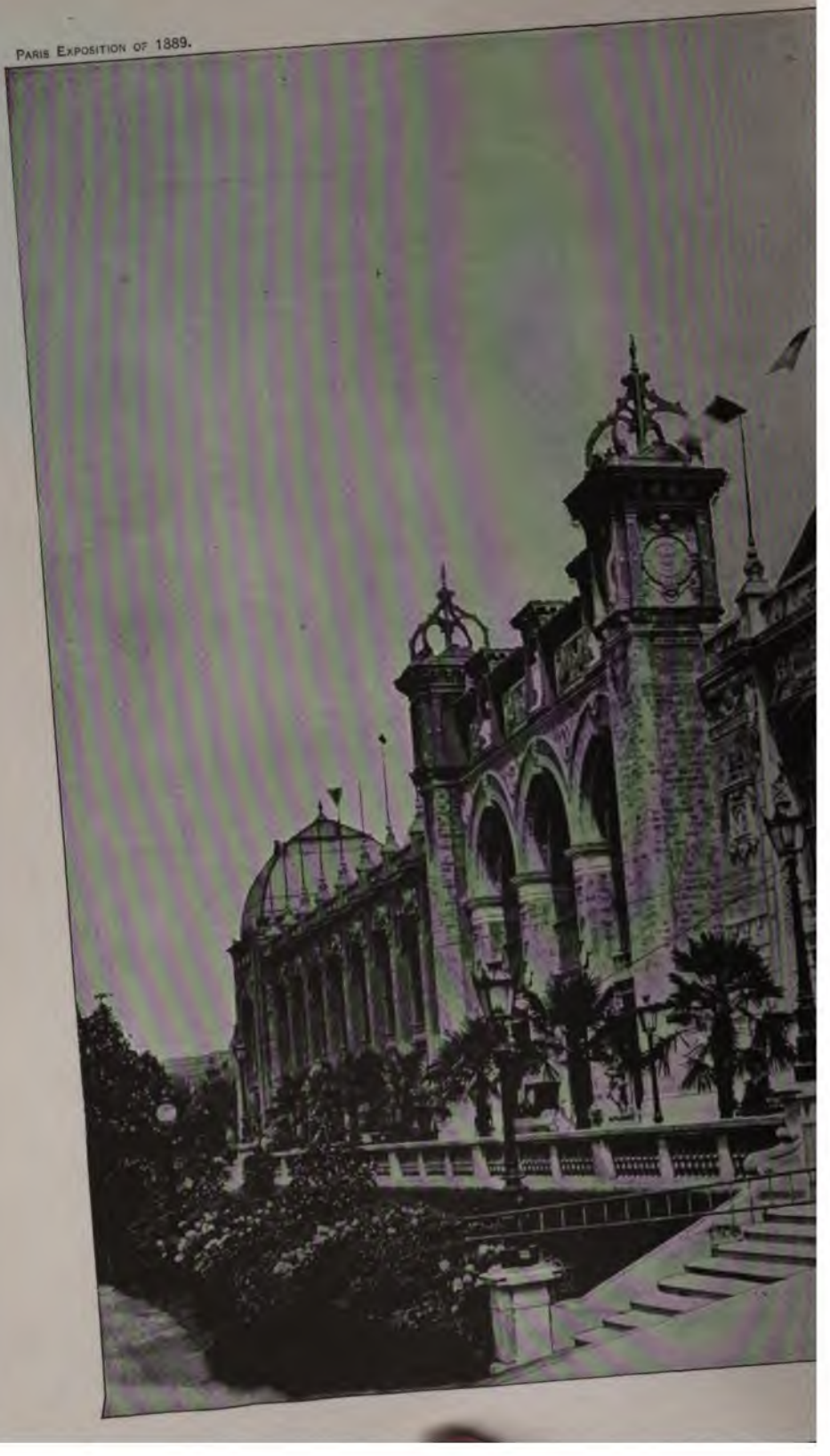
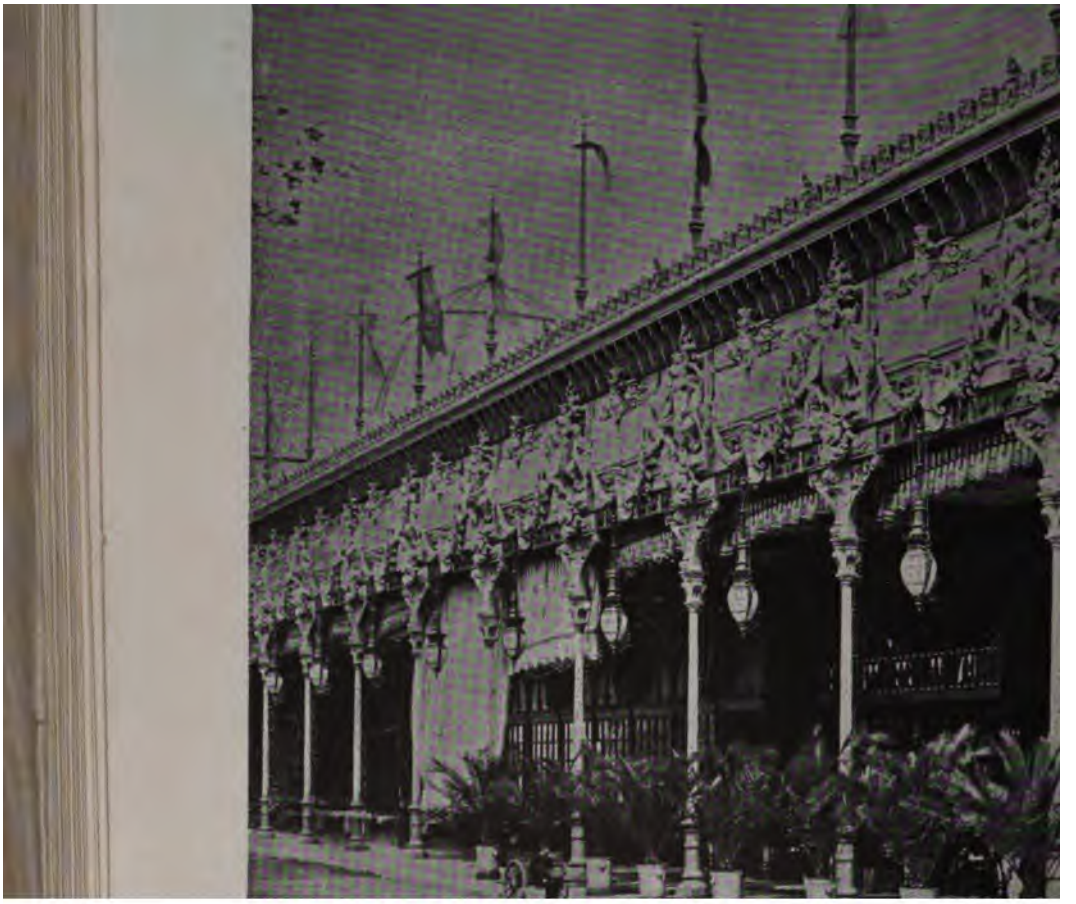
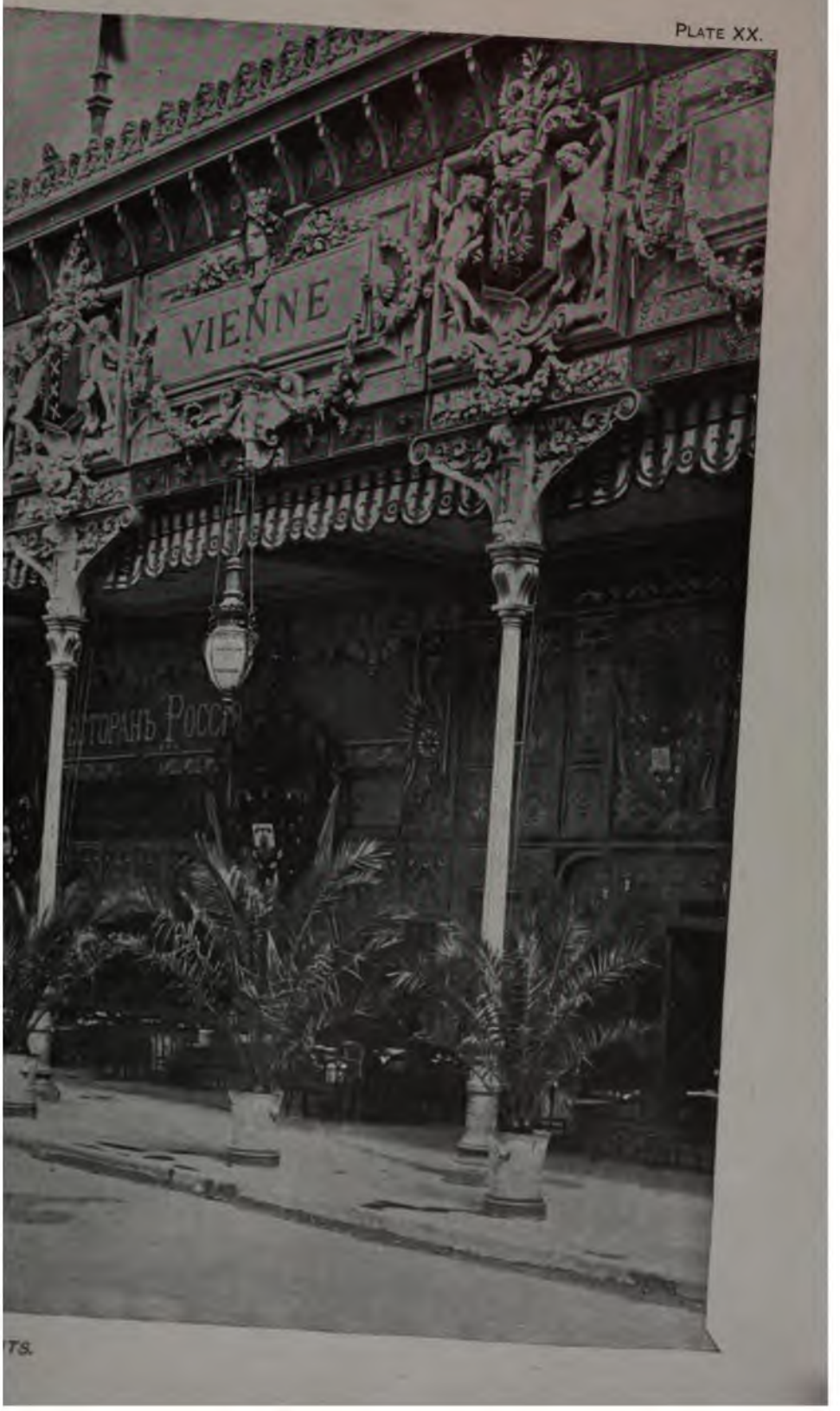


PLATE XVIII.

PARIS EXPOSITION OF 1889.







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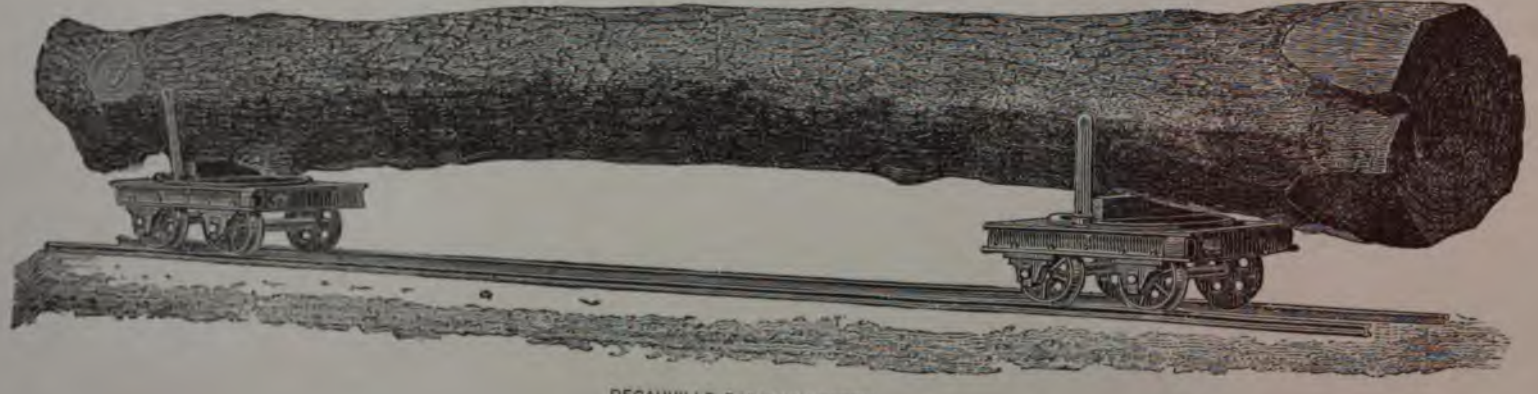


DECAUVILLE RAILWAY SYSTEM.

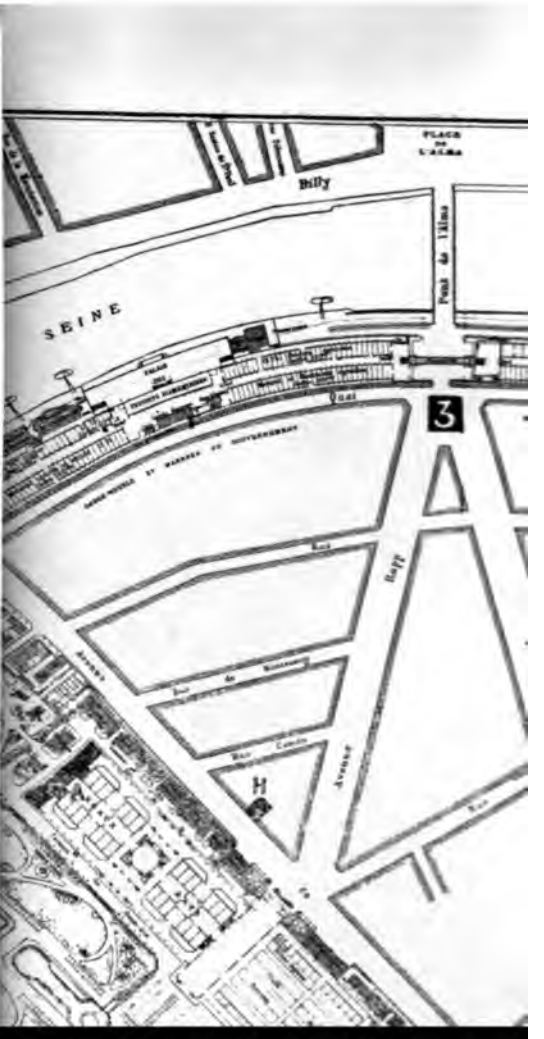
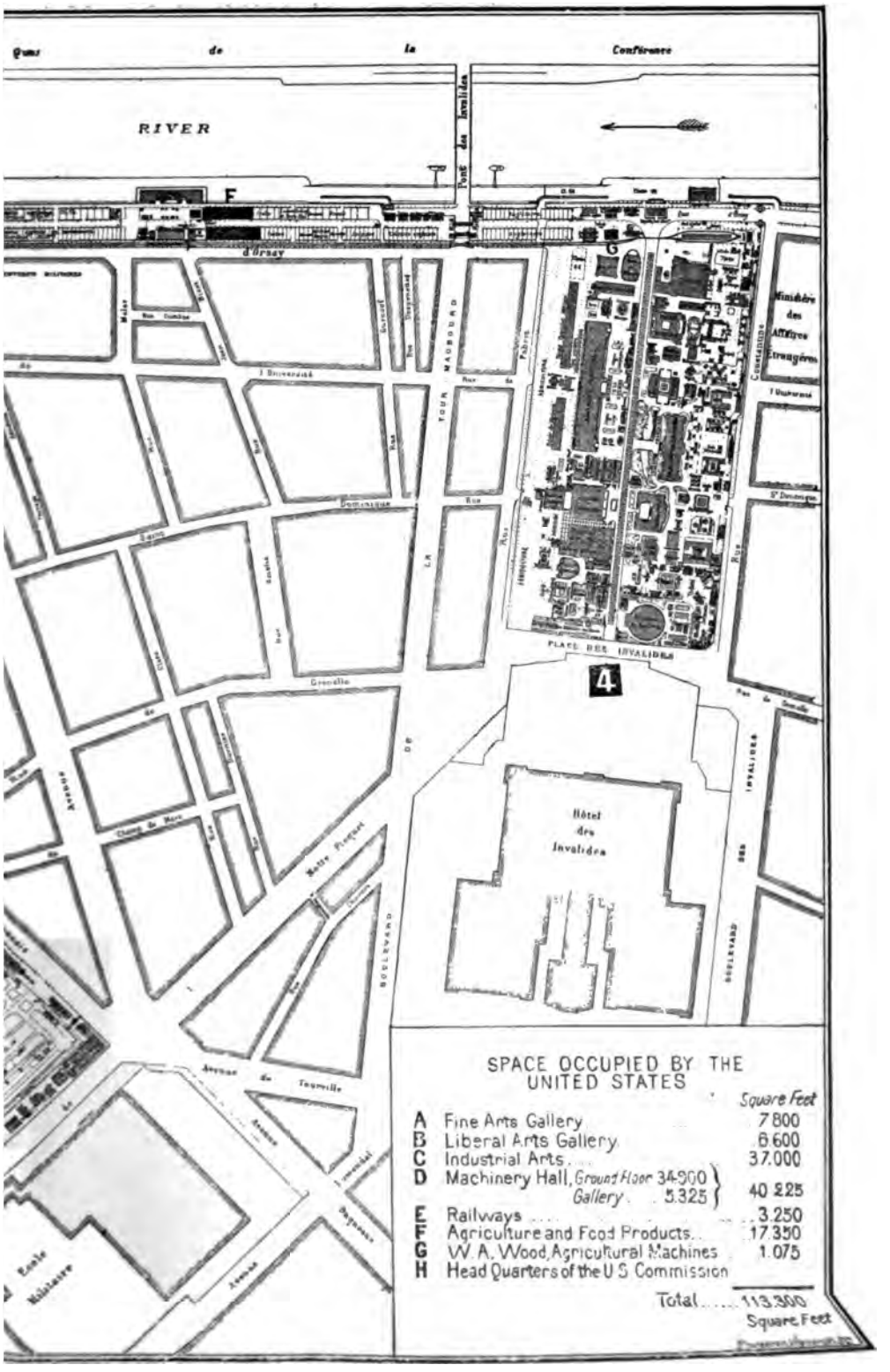
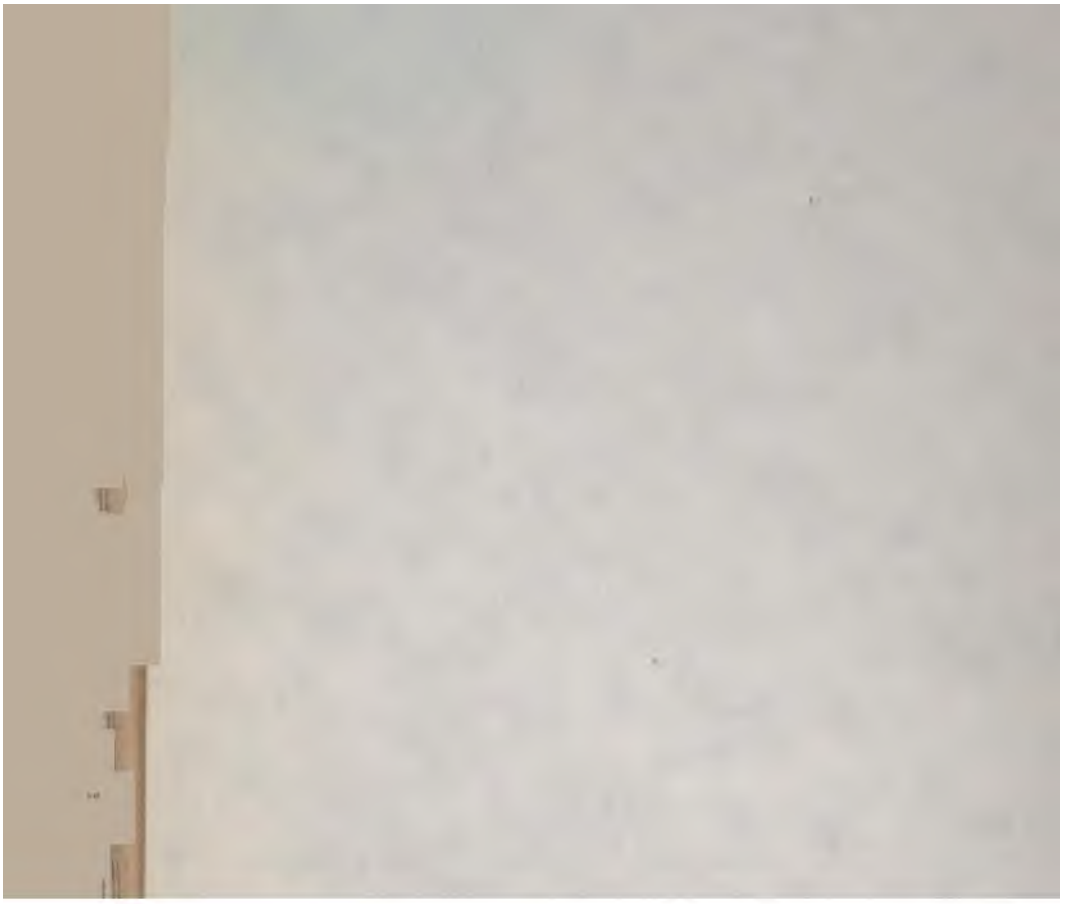

Pont de l'Alma
Bailly
SEINE
Quai
3
Bailly
Avenue
H

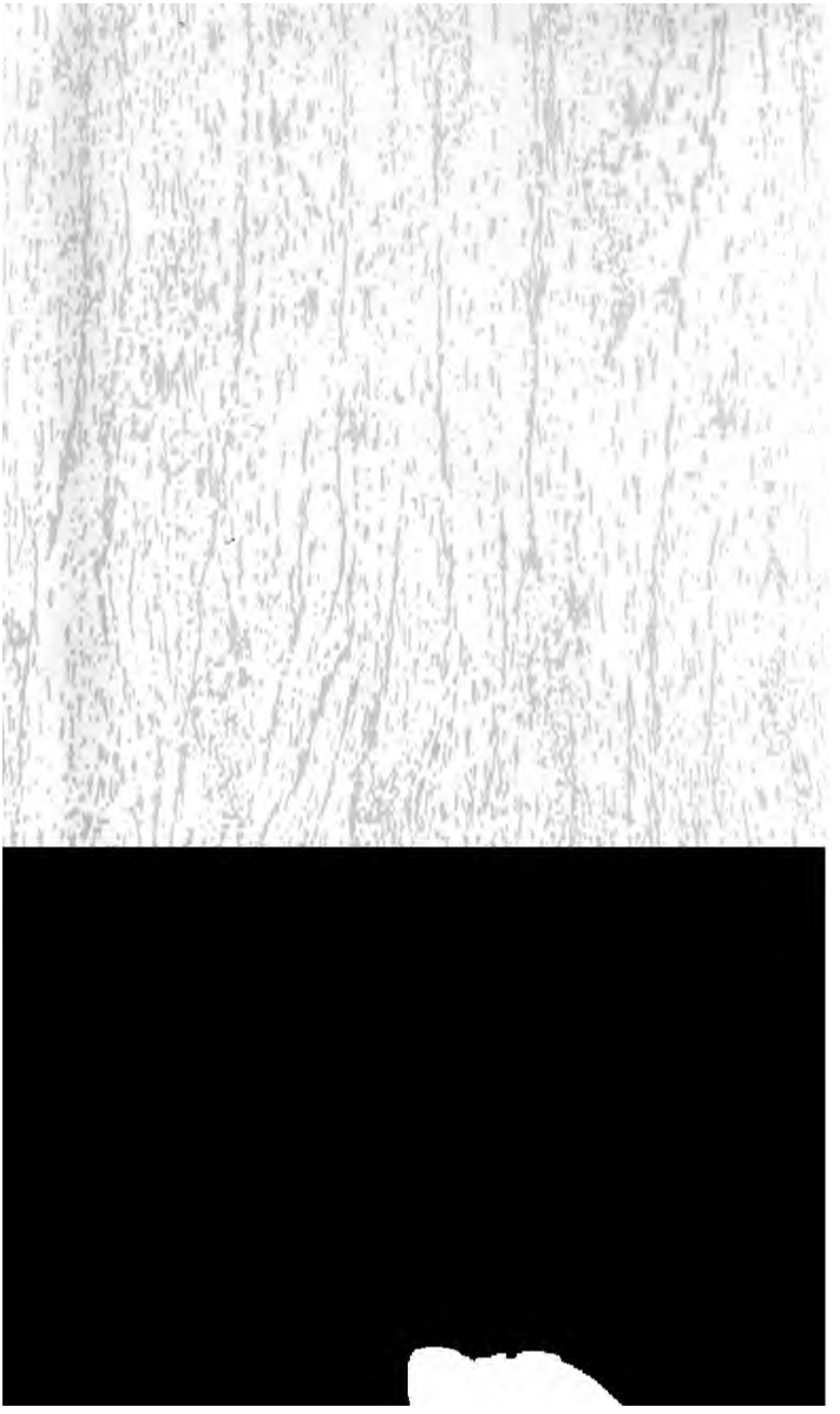
PLATE XXII.



SPACE OCCUPIED BY THE UNITED STATES

		Square Feet
A	Fine Arts Gallery	7.800
B	Liberal Arts Gallery	6.600
C	Industrial Arts	37.000
D	Machinery Hall, *Ground Floor* 34.900 *Gallery* 5.325	40.225
E	Railways	3.250
F	Agriculture and Food Products	17.350
G	W. A. Wood, Agricultural Machines	1.075
H	Head Quarters of the U. S. Commission	
	Total	113.300 Square Feet





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